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OF THE

Horticultural Society

OF

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PREFACE.

WHEN the Society completed the Second Volume of their Transactions in March 1818, arrangements were made to insure, if possible, the publication of portions of the succeeding Volumes, at less distant periods than had hitherto been done. They flattered themselves with the hope of being able to complete a Volume, every second year, by the publication of one-fourth part at intervals of six months; and it is very satisfactory that, so far, that hope has been realised. The Third Volume is now submitted to the Public, the contents of which, they trust, will prove that no efforts have been spared to render it literally the Transactions of a *Horticultural* Society, the most scrupulous attention having been paid to avoid encroachments upon the province of the scientific Botanist, and to confine their views to subjects immediately connected with the respective departments of *useful* and *ornamental* gardening.

One of the objects which has particularly engaged the attention of the Society has been the formation of an Experimental Garden. What they have yet been able to accomplish in this respect, they consider only as temporary; but it has been sufficient to prove that they have not over-rated the

advantages to be derived to Horticulture, from a garden of such description, upon an extensive scale, and of this there are Papers in the present volume which are some evidence; they, therefore, look forward with confidence to that period when, either by their own increased efforts, or by an aid superior to their own, they may effect an establishment, which shall at once become a National school for the propagation of Horticultural knowledge, and a standard of reference for the authenticity of every species of Garden produce.

That the country duly appreciates the importance of the objects to which the attention of the Society is directed, may be inferred from the very flattering circumstance, that within a period of two years they have considerably more than doubled their numbers, and that in this increase they have the satisfaction of enumerating many of the most distinguished names in the kingdom, whether rank, character, or talent be considered.

In the class of *Foreign Members* they have to congratulate themselves on having added many persons of the highest consideration for Botanical and Horticultural knowledge, in various parts of the world; and to the class of *Corresponding Members,* both at home and abroad, they have made such additions as cannot fail to prove of the highest advantage in promoting the objects which they have in view. This class, as will be seen by a reference to the List of the Society, contains many individuals eminent for their scientific attainments, while at the same time a large proportion consists of Practical Gardeners, whose emulation has been excited, and whose

talents have been developed, by the attention which the Society is ever ready to pay to their communications, by which they are encouraged to state those facts which their practical experience may discover; and of the value of which, over mere theory, none can entertain a doubt.

In the period which has elapsed since the Society last addressed the Public, they have had to deplore the loss of their august and venerable Patroness; their consolation, however, has been, that the protection which Her late Majesty extended to them is in the most gracious manner continued by His Royal Highness the Prince Regent, who has evinced at once his disposition to promote useful Science, and his veneration for the memory of his illustrious parent, by becoming the Patron of the Society, and thus protecting and encouraging that Institution, which she was pleased to honour with her peculiar favour.

It has been the highest source of gratification to the Society, to find that in every step which they have advanced towards the amelioration of Practical Horticulture, as well as in theoretical investigations, they have received the most cordial and able assistance from the Nurserymen, and Market and Practical Gardeners, as well in the vicinity of the metropolis, as in remote parts of the kingdom. No petty jealousies or fears have operated to the prejudice of the Society's views; but, on the contrary, in the intercourse which has taken place with them, they have exhibited an union of sentiment and an ardent desire for the dissemination of practical knowledge, the importance of which is every day

felt by those engaged in the care of the Society's concerns. This liberality of feeling will be best shewn, by referring to the number of persons in those classes, which are to be found not only amongst the Fellows of the Society, but also amongst the contributors to the present Volume. To the liberal views of the Society, and to the disinterestedness of their practice, they owe this feeling of unity. The acquisitions which they are continually making, are not reserved, through selfish motives, for themselves, but are either at once distributed to the Nurserymen, or propagated in their own Garden with the view to their future distribution to the public through the same channels; by which means it is hoped the kingdom at large will obtain them with the greatest facility and correctness.

The unexampled rapidity with which the Society has increased in numbers, rendered it absolutely necessary to provide such apartments, as might be sufficiently commodious for transacting their business, and a spacious room in which their meetings might be held with more convenience than formerly. The House, with its adjoining room, which they now occupy, presented itself, and they are happy to say that its favourable situation, and general convenience for the purposes of the Society, leave them nothing more to wish for on this head.

Another object, to which the attention of the Society has been, and still is directed, is the formation of an Horticultural Library of reference, for the use of the Members generally. To render this as perfect as possible, no pains will

be spared; but as it is an undertaking of some difficulty, and of considerable expense, they cannot flatter themselves with the hope of very speedily completing it. To the liberality of many of the Members they already owe much, and they indulge the expectation, that future presents of works connected with the subject, will materially aid the accomplishment of this part of the plan which they have laid down for the general improvement of the Society.

The collection of Drawings of Fruits, formed under the direction of a Committee, is already considerable, and by a perseverance in the plan proposed it will, ere long, surpass all others, in point of numbers, as much as it already does in point of excellence. In justice they cannot omit to state, that to the correct eye and skilful hand of Mr. William Hooker, the Artist regularly employed by the Society, they owe this invaluable assemblage, the importance of which, as standards of reference, will long be felt and acknowledged. Independent of these, the Society are forming Collections of Drawings of Ornamental Plants, one of which consists of the most remarkable and beautiful plants of China, drawn by an artist retained in their service at Canton; the superior manner in which these drawings are executed, and the judicious selection of the subjects, render them highly valuable and interesting.

Regent Street, January, 1820.

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Regent Street, January, 1826.

ADVERTISEMENT.

The Committee appointed by the Horticultural Society to direct the publication of the Papers read before them, take this opportunity to inform the Public, that the grounds of the choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them, without pretending to answer for the certainty of the facts, or the propriety of the reasonings contained in the several Papers so published, which must still rest on the credit or judgment of their respective Authors.

It is likewise necessary, on this occasion, to remark, that it is an established rule of this Society, to which they will always adhere, never to give their opinion, as a body, upon any subject either of Nature or Art, that comes before them. And therefore the thanks which are proposed from the Chair, to be given to the Authors of such Papers as are read at the General Meetings, or to the Persons who send fruits, or other vegetable productions, or exhibit Inventions of various kinds to the Society, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by these communications.

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Mr. Knight's new Peach, from an Almond.

TRANSACTIONS

OF

THE HORTICULTURAL SOCIETY.

I. *An Account of a* Peach Tree, *produced from the Seed of the* Almond Tree, *with some Observations on the origin of the* Peach Tree. *In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read October 7, 1817.

My Dear Sir,

I have addressed to you a couple of *Peaches,* of a new variety, which I will beg you to exhibit at the next meeting of the Horticultural Society: not, however, on account of any merits, which I suppose the variety to possess, but, solely, on account of the singularity of its origin, it being the offspring of a sweet Almond, and of the pollen, only, of a Peach. The tree produced six Peaches, besides those I have sent you; three of which cleft open, like Almonds, when nearly ripe; whilst the others retained the form, and character, of Peaches; and the flesh of all was perfectly soft, and melting. One of these was considerably larger than the

largest you receive, having measured eight inches in circumference: and as the tree grew in a pot, which did not contain a square foot of mould, and the first fruit of every seedling tree has proved, in all my experiments, to be of much less size than its subsequent produce, I imagine, that the future fruit of this variety, will a good deal exceed the bulk indicated by the present sample.

The general character, and quality, of the fruit I send, and the diminished size of its stone, comparatively with that of the Almond, will, I fear, induce the Society to apprehend some error in the experiment: but I beg to assure them that none can possibly have occurred; and that the result was as unexpected by me, as it would have been by them; for I did not entertain the slightest hope, that a tree, capable of producing a melting Peach, could have been, by any means, obtained immediately from an Almond. I had, however, long before, entertained an opinion, that the common Almond and the Peach tree constituted only a single species; and that the Almond might, by proper culture, through many successive generations, be ultimately converted into a Peach, or Nectarine.

Many circumstances, in the ancient history of the Peach, conjoined to lead me to this conclusion. It does not appear to have been known in Europe till about the reign of the Emperor Claudius; and it is, I believe, first mentioned by Columella.* Pliny has given the first accurate description of it; and he states it to have come, through Egypt and Rhodes, into Italy, from Persia, which is universally understood to be its native country.† Yet it could not have

* Lib. 10. † Lib. 15. cap. 13.

existed in Persia, a few centuries previous to the period of its appearance in Europe, or the Greeks must necessarily have known it; as much intercourse constantly took place between the Asiatic Greeks and the Persians, and the Kings of Persia usually entertained Greek physicians, who were botanists, in their court. The *Tuberes* of Pliny also appear to have been something intermediate between the Almond and Peach; for he states the trees, which produced this fruit, to have been propagated by being grafted upon Plum stocks,* and to have blossomed later than the Apricot;† and that the fruit itself was covered thickly with down, like the Quince.‡

The *Tuberes* must, therefore, I conceive, have been swollen Almonds, or imperfect Peaches, (for their merit, as fruit, appears to have been very inconsiderable,) and Du Hamel has given an account of a fruit, which accurately corresponds with this description, being sometimes produced by a variety of Almond tree in France; and which, he says, is bitter, and not eatable in its crude state.§

The bitterness, in this case, I conclude, can only arise from the presence of the Prussic acid; and as this acid, without being extracted by distillation, operates very injuriously upon many constitutions, some explanation appears to be given of the cause why the Peach was reported to possess deleterious qualities, when it first came from Persia into the Roman empire.‖

* Lib. 17. cap. 14. † Lib. 16. cap. 42. ‡ Lib. 15. cap. 14.

§ Du Hamel, Arb. Fruit. Article Amygdalus.

‖ Columella, Lib. 10.

Stipantur calathi et pomis, quæ barbara Persis
Miserat (ut fama est) patriis armata venenis.

The fact, if ever so decisively established, of the specific identity of the Peach and Almond, is probably of little importance to the gardener, further, than that it points out to him the extensive changes that culture is capable of producing, in the forms and qualities of fruits: and I made the experiments, which are the subject of this communication, with scarcely any other view, than that of simply ascertaining the specific identity, or diversity, of the Peach and Almond, and with a good deal of indifference relative to the result. Nevertheless, as the wood of the Almond tree ripens much earlier, and more perfectly, that that of the Peach tree, in our climate, and as its blossoms are more hardy, I am not without hopes, from observations which I have made upon the habits of my seedling plants, that some valuable varieties of the Peach will be obtained, in a second or third generation, from the Almond. I have, at present, seen the fruit of one seedling plant only, and that not one of promising character; but I have others, which will produce blossoms in the next season, one of which, a descendant from the early Violet Nectarine, as its male parent, presents very large and beautiful foliage, with a purple bark, and all the character of a Peach tree of the most improved kind; and I look forward to the pleasure of sending you, next season, a fruit of much superior quality to that you now receive.

I am, my dear Sir,

sincerely yours,

Thomas Andrew Knight.

Downton, September 13, 1817.

Note by the Secretary.

The two Peaches, alluded to in this paper, have been very accurately delineated by Mr. Hooker. They were of a perfectly globular form, the largest exceeding seven inches in circumference. The skin, which was covered with a rather thick down, was of a delicate yellow, tinted on the sunny side with pale red, and beautifully marbled with a deeper shade of the same colour. The flesh was of a pleasant, pale citron tint, and, round the stone, of a very brilliant carmine red; it was perfectly melting, sweet, and very juicy, though not very high flavoured, but it had suffered in this quality by the injury, sustained in carriage. The stone was large, in proportion to the fruit, nearly round, with a small point at the top, very rugged, and had much of the same kind of farina on its surface as is usually seen on that of the Almond, in its fresh state; it also separated very clearly from the flesh, some short filaments only adhering to it.

II. *On the Cultivation of* Mushrooms, *in exhausted Cucumber or Melon Beds. In a Letter to the Secretary. By the Rev.* William Williamson.

Read October 7, 1817.

Sir,

In a Paper, in the second volume of the *Horticultural Transactions*,* an account is given of a method of *raising Mushrooms*, by means of a stove; but as it seems expensive, and out of the reach of many people, I am induced to send the Society an account of a method, which I have pursued, with great success, for several years. It is more economical than the one alluded to, and can be put in practice by any one, who is in the habit of raising either Cucumbers or Melons.

Having made my Melon bed in the usual manner, when the burning heat is over, and the bed is ready to be earthed to a sufficient thickness, I place spawn on the sides of the hills, and also on the surface of the bed, and then cover the whole with mould, as usual, managing the Melons exactly in the same manner as if the spawn were not there, not omitting even to tread it, as I find that a compact loam is more congenial to the growth of the Mushroom, than the light rich compost of the Cucumber bed. The heat will soon cause the spawn to run, and extend itself through the dung, to the surface of the ground. In September, or October following, when the Melon bine is decaying, the bed is carefully cleaned,

* Page 212.

the glasses are put on, and kept close; and when the mould becomes dry, it must be frequently watered, but not immoderately, as too much wet would destroy the spawn; advantage should also be taken of every gentle shower, for the same purpose. The moisture coming up on the dry earth, produces a moderate heat, which soon causes the Mushrooms to appear in every part of the bed, in such abundance as even to prevent each others growth. I have frequently, at one time, gathered two bushels from a frame 10 feet by 6, and have produced individual Mushrooms of nearly two pounds weight. The mould being kept warm by the glasses, and properly watered, the Mushrooms will continue to spring, till the frost of winter prevents their further growth. I then leave the bed, frame, &c. just as they are, and early in spring, as soon as the frosts may be supposed to be over, I take off the frame and glasses,* and cover the bed lightly with straw; when the warm, enlivening showers of spring, cause the Mushrooms to be again produced in every part, till the drought of summer renders it difficult to keep the bed sufficiently moist for their growth. Sometimes I suffer the bed to remain, in order to produce a crop in the second autumn, but more generally take the bed to pieces, for the sake of the dung, and also for the purpose of procuring and drying the spawn, against the return of spring.

When I first thought of raising Mushrooms, in the manner above described, I was apprehensive, lest the spawn, by running among the roots of the Melons, might injure their growth.

* The frame and glasses are taken off in order to place them upon fresh beds; but should they not be wanted, it would be more advisable to keep them on, and the crop in the second autumn would be much increased.

I, therefore, planted it in one light only, but the result convinced me, that it did no injury, as, on the only plant in that light, I grew a Melon, of the Black Rock kind, weighing $8\frac{3}{4}$ pounds, for the first crop, and another, $6\frac{1}{2}$ pounds, for the second crop: both of which ripened well. Since that time, I have always placed the spawn over the whole of the bed, and have never failed to produce a good crop of both Melons and Mushrooms. Should it be thought advisable to have a supply of Mushrooms during the depth of winter, I am confident, (though I have not tried the experiment) that they might be obtained, at a trifling expense, by lining the bed with hot dung, and using other precautions to keep out the cold air.

The catsup extracted from Mushrooms raised by the above method, is much superior to that commonly obtained from mushrooms produced naturally: it is extremely high-coloured, and of a much finer flavour.

Should you think the above description of any consequence, your laying it before the Horticultural Society will oblige,

Sir,

your obedient humble Servant,

William Williamson.

Westbere, near Canterbury,
September 12, 1817.

III. *Description of a peculiar Method of* training Vines under Glass, *in a House; with a Statement of the Advantages which result from it. In a Letter to the Secretary. By* Alexander Seton, *Esq. F. H. S.*

Read November 4, 1817.

My Dear Sir,

Having but little knowledge in the culture of the Vine, I do not expect that the method of training it, which I pointed out to you a few days ago, in my green-house, will be found to deserve much notice; but as I have practised it, with considerable success, for several years, and as it is possible that it may afford some useful hint, even to persons of more experience than myself, you may, perhaps, deem it worth while to read a short statement of it to the Society.

The Vine having, like other trees, a tendency to produce its most vigorous shoots at the extremities of the branches, and particularly so at those which are situated highest, it generally happens, when it is trained, as is most frequently done, across and upwards, from the front to the back of the house, that the greater portion of the fruit is borne near the top, while the lower parts are comparatively barren. This takes place, whether the branches be made to consist chiefly of vigorous terminal shoots, preserved at considerable length, or the leading shoots be kept short, and lateral spurs be left for the production of the fruit; but in the latter case, the evil exists in a smaller degree; for the spurs, or short lateral

branches, divert the sap in its ascent, producing, by means of its flowing to their extremities, an approximation to the effect of long branches. The same inconvenience would occur, to a certain extent, if the Vines were trained in a like manner, in the open air, but it is greatly augmented in a house, in consequence of the air being much hotter, as every one knows, at the top than beneath. Having observed that the fruit produced on the vigorous shoots, which usually grow at the extremities of the long branches, is, generally, more abundant, and of a finer quality, than that produced on the short lateral ones, I was desirous to promote the growth and preservation of the former; but the usual mode of training the branches, across the house, and upwards, being subject to the objection before mentioned, and little scope being afforded for it in a house of small dimensions, I thought I should obviate these inconveniencies, in great part, and attain another object, presently to be mentioned, by training the branches in a horizontal direction, and keeping the whole of the fruit-bearing part of each tree nearly on the same level. With this view, five Vines were planted at the front and ends of a house, 25 feet in length, provided with rods placed horizontally under the glass of the roof, 20 inches asunder, and extending from end to end. The first Vine, placed at one end, being trained up to the two lower rods, a shoot of it was laid along each of them, and continued successively from year to year, till it reached the other end: then, the shoot on the lower rod was turned upwards to the next, and led back upon it towards the stem of the tree; while that on the upper rod was turned down, and led back, in like manner, on the lower one. During this process, a

sufficient number of spurs, or short branches, was left annually, on the old wood, to produce fruit. When the leading shoots, which had been thus trained in a retrograde direction, approached towards the end, whence the original branches proceeded, preparation was made for a succession of young wood, by bringing forward two fresh shoots from the stem of the tree, and leading them along, close to the preceding ones. As these, and the leading shoots of the first branches, which were then on their return, advanced, the spurs on that part of the old wood, to which they had reached, were cut out, to make room for them, the naked stem only being left. When the second series of branches had returned nearly to the end, at which the trunk was situated, the first series, on which there was then but little of the herbage remaining, was cut out at the trunk. Fresh shoots were then brought forward to succeed the second series: and so on, without end. It would be superfluous to dwell on the mode of managing the other trees; as it will be perceived that, following the same principle, they must be laid along the higher rods in succession, two rods being allowed to each tree; and when the stem is not at the end of the house, two branches are to be trained eastward, and two westward, along the rod. Thus, in a house of 25 feet in length, instead of having only 15 or 16 feet, to admit of the length of a branch, as would be the case under the usual mode of training, across the house, we have a range of 50 feet, which affords ample scope for the long shoots at the extremities; and these, I find, when laid on in the horizontal position, and left from 3 to 5 feet long, according to their strength, usually bear fruit at all their buds, while the spurs on the old wood are

also very productive. By these means, the tree possesses the double advantage of no part of it being robbed of its nourishment, by means of any other vegetation, which is supplied from the same root, being situated either in a higher position, or warmer atmosphere. To what extent the former of these circumstances alone may operate, I cannot determine, from any actual experiment; but, from the general observations I have made, that the growth of the Vine, as well as of other trees, is most luxuriant in the parts that are situated highest, I am inclined to think, that its effects are very considerable. Others, who have made the same observation, have recommended the training of the shoots in a zig-zag manner, advancing upwards, with the view of retarding the ascent of the sap through the inclined parts; this, however, I have found to have little or no effect, the general direction of the shoot being upwards, through all the bendings. But whatever may be the effect produced by the horizontality of the position, in equalizing the luxuriance of the growth, I conceive that no doubt will be entertained, in regard to that of an uniformity of temperature; and this is fully obtained by the method in question.

I now come to the other object to be attained by the mode of treatment, which will be stated in a few words, as the effects produced in regard to it, will be very evident. In the usual mode of management, each tree is under the influence, in its different parts, of all the degrees of temperature in the house; but under the mode now proposed, each tree has its own peculiar climate, to which alone all its parts are exposed. This affords us the command of a most convenient variety, in regard to earliness in the ripening of fruit.

For example, if there be a wish to save fuel, and yet to have grapes of several varieties, which ripen at different seasons, of the late sorts there will, under the common method, be only a few brought to perfection at the tops of the trees, whilst those that are near the bottom will not ripen, and that part of those trees will accordingly be useless. But in the arrangement above described, the early and late sorts may be procured at the same time, in equal abundance and perfection, by training the early sorts, let us suppose the *Sweet-water,* at the bottom, the middling ones, such as the *Black Hamburgh,* next, and the late, such as the *Muscat* of *Alexandria,* at the top. Again, if it be wished to have some very early, and others very late, the order may be reversed, by placing the early varieties at the top, and the late at the bottom: in which case, more fuel will be required. This method, it will be perceived, may be varied in many ways, and will operate under all the degrees of forcing.

I have the honour to be, &c.

Alexander Seton.

Stamford Hill, Oct. 7, 1817.

IV. *Account of a Method of conveying Water to Plants, in Houses, invented by Mr.* George Loddiges *of Hackney. By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read December 2, 1817.

I have great pleasure in communicating to the Horticultural Society the particulars of a plan for *watering plants, in houses,* invented by Mr. George Loddiges, one of the Partners in the firm of Messrs Loddiges and Sons, of Hackney, whose extensive nursery gardens are well known to every collector of rare and valuable plants.

The plan I am about to describe is most simple in its operation, and not only supplies water to the plants, without labour, but in a way that must be more beneficial than the usual one, by a watering-pot.

A leaden pipe of half an inch bore, is introduced into one end of the house, in such a situation that the stop-cock, which is fixed in it, and which is used for turning on the supply of water, may be within reach: it is then carried either to the upper part, or the back of the house, or to the inside of the ridge of the glass frame-work, being continued horizontally, and in a straight direction, the whole extent of the house, and fastened to the wall, or rafters, by iron staples, at convenient distances. From the point where the pipe commences its horizontal direction, it is perforated with minute holes, through each of which the water, when turned on,

issues in a fine stream, and, in descendiug, is broken, and falls on the plants, in a manner resembling a gentle summer shower. The holes are perforated in the pipe with a needle, fixed into a handle like that of an awl; it being impossible to have the holes too fine, very small needles are necessarily used for the purpose, and in the operation great numbers are of course broken. The situation of the holes in the pipe must be such as to disperse the water in every direction that may be required, and in this particular the relative position of the pipe, and of the stations of the plants to be watered, must be considered, in making the perforations. The holes are made, on an average, at about two inches distance from each other, horizontally, but are somewhat more distant near the commencement, and rather closer towards the termination, of the pipe, allowing thereby for the relative excess and diminution of pressure, to give an equal supply of water to each end of the house. A single pipe is sufficient for a house of moderate length: one house of Messrs. Loddiges, which is thus watered, is sixty feet long, and the only difference to be made in adapting the plan to a longer range, is to have the pipe larger. The reservoir to supply the pipe must of course be so much above the level, as to exert a sufficient force on the water in the pipe, to make it flow with rapidity, as it will otherwise escape only in drops; and as too strong a power may be readily controlled by the stopcock, the essential point to be attended to, in this particular, is to secure force enough.

From the above details it will be observed, that some nicety is required in the arrangement and formation of the

machinery; but it is only necessary to view the operation in Messrs. LODDIGES house, to be convinced of the extreme advantage and utility of the invention, when it is properly executed.

V. *Particulars of a* Peach Tree *in the Garden at Cockfield Hall, the Seat of Sir* Charles Blois, *Bart. in the Parish of Yoxfield, Suffolk, By the Right Hon. Lord* Rous, *F.H.S. Communicated by* Roger Wilbraham, *Esq. F.R.S. &c. Vice President.*

Read January 6, 1818.

This Peach tree is of the *Noblesse* kind; it was purchased of Mr. Cunningham, nurseryman at Paddington, in the year 1794, and was then planted by the late Sir John Blois, on the outside of a forcing-house, into which it was brought, through an aperture in the front wall. The house has no flue, and at first did not exceed 20 feet in length by 16 feet in width, and 9 in height, but it has since been lengthened to 38 feet. The circumference of the stem of the tree, at a foot from the ground, is 2 feet 10 inches; it is trained under the rafters, in the shape of a fan, and completely fills the house, and there is no doubt, were the space greater, might be extended much farther. The glass is generally put on about the middle of March, but this depends on the state of the fruit buds. The soil is rich and loamy; the substratum, at little more than two feet from the surface, is bog-earth: no particular dressing is applied beyond the forking in about the roots a few barrowfulls of rotten horse-dung in the early part of the winter. The mode of pruning differs in no respect from the usual one, and it is generally performed in the month of January. By attention to fumigation with tobacco, and occasionally using a wash, composed of tobacco liquor,

sulphur, and soap suds, in the months of May, June, and July, the tree has uniformly been kept free from blight, and every sort of insect. The bark looks like silver, and there is not, during the whole season, a single curled leaf to be seen on the tree.

The size of the fruit varies very little, between one year and another, the weight being from eight to ten ounces, each Peach, and sometimes more. The finest grow near the top, though the tree is beautifully covered in all its parts. In 1811 four hundred and twelve dozen were taken off, to thin it, and sixty-nine dozen and seven Peaches left for a crop. Sir Charles has heard of an equal number having been frequently suffered to ripen, before he came to reside in Suffolk; but of late years he has seldom allowed more than fifty dozen to remain, to which circumstance he, in a great measure, attributes the perfect health, and great vigour of the tree.

VI. *On the Cultivation of the* Rampion. *By Mr.* James Dickson, *F. L. S. Vice President.*

Read February 3, 1818.

The Rampion has, of late years, been altogether neglected in our gardens, though it is much cultivated by the French, by whom it is called *Raiponce*, and it is very common in their markets. It is the *Campanula Rapunculus* of Linnæus and of modern botanists, the *Rapunculus esculentus* of Ray, and the *Rapuntium parvum* of Gerrard. It grows wild in France, Germany, Switzerland, and the north of Italy; and has long been considered a native of England, being sometimes found, apparently wild, particularly in the neighbourhood of Croydon, in Surrey, where it was noticed by Hudson; it is, however, possible, that it may have only escaped from the hands of the cultivator, for it must be observed, that wherever it has been permitted to seed in a garden, it comes up afterwards, for many years, in places very remote from that where the parent plant grew, the seed being very light, and accommodating itself readily to spots where it is not disturbed.

The plant is figured in *English Botany, tab.* 283: it is a biennial, with a long white spindle-shaped root; the leaves grow close to the ground, until it shoots up into flower, in which state its panicle of blue flowers, about two feet high, may fairly be considered ornamental. The root is the part which is used: it is eaten raw, like a radish, having a very

pleasant nutty flavour; it is also sometimes cut into winter salads, and then the leaves, as well as the root, are used.

The seed should be sown in the latter end of May, on a shady border of rich earth, not over stiff, the mould being made as firm as possible: it is better not to rake in the seed, which, being so very fine, may, by that operation, be buried too deep. If the sowing is earlier than May, the plants will sometimes run to flower in the autumn, and so become useless. Moderate waterings must be given, as the seeds vegetate, through a fine rose of a watering-pot, and it is necessary that the bed be kept, at all times, tolerably moist.

When the plants are of sufficient size, they must be thinned out, to the distance of three or four inches apart; those drawn will bear transplanting well, if put into a border similar to the seed bed, but care must be taken to insert the roots straight into the earth, and not to press the mould too close about them; the roots which become forked are not so good as the straight ones. In November, the plants will be fit for use, and will continue so until April, about which time they begin to flower: they should not be taken out of the ground, till wanted; a few should be left for seed, which will be produced in abundance.

VII. *On the proper Treatment of the* Gloriosa superba. *By Mr.* John Sweet, *Corresponding Member of the Horticultural Society.*

Read November 4, 1817.

The *Gloriosa superba* is a native of the East Indies, whence it was introduced into our gardens, above 120 years ago. It has been figured in Andrews's *Botanist's Repository, plate* 129, in the *Botanical Register, plate* 77, as well as by Redouté in his *Liliaceæ, plate* 26; but it is called in this last work, as well as by others of the French botanists, *Methonica superba.*

I have been many years acquainted with this elegant plant, and regret that it is but seldom seen in perfection, and its proper state of grandeur, in our stoves. Its failure, I apprehend, arises chiefly from the defective method in which its roots are preserved during their inaction, and from the want of proper treatment, when they first vegetate, in the spring. Injured at these periods, the plants generally continue, through the summer, weak and unpromising, throwing up only a few small stems, which do not flower in sufficient strength and beauty.

Under the course of management, which I am about to describe, I have constantly succeeded well with them: it is somewhat similar to that recommended in *Miller's Gardener's Dictionary;* but as I am able to add some details which, to insure success, are requisite to be attended to, I hope the

following notes will not be altogether without use to the cultivators of the plant.

When the stalks and foliage have decayed, in the autumn, and left the root, like a well ripened potatoe, in a dormant state, the pot in which it must be removed from the bark bed to the top of the hot-house flue, at some distance from the fire, all the warmth at this time necessary being merely what is sufficient to keep the earth in the pot free from damp; and to prevent the waterings of the house, or other moisture, falling on the earth in the pot, it should be covered, by inverting upon it another pot of the same size; or if larger, it will hang over its edges and more effectually exclude the wet. If the roots are small, two or three may be placed together in the same pot, whilst in their dormant state; but if they are thus shifted, the mould must be well shaken down in the pot, in order to prevent the access of air to them; the old mould in which they grew must also be used; for fresh earth, or sand, would stimulate them to move too early.

About the second week in March, the roots must be replanted, putting one or two, according to their size, into pots measuring six inches over. The best compost for them is fresh loam, mixed with an equal quantity of bog earth of good quality: the loam should be good, not over rich with dung, nor too heavy. The roots are to be covered about two inches deep, and care must be taken not to break them, unless nature has shown where it is practicable to divide them easily. The pots, when filled, must be plunged into the bark-bed, where the heat should be equal to 95 degrees of Fahrenheit's scale. Water is to be given very sparingly at first, and though, as they grow, they will require a more liberal

supply, yet it is necessary, at all times, to be moderate in giving it. The heat must be well kept up, and as the shoots extend, they must be supported by sticks, or trained, in any direction, on wire or cords.

Under such treatment as I have described, I have known one root to grow ten feet in the course of a season, and to have numerous blossom stems upon it.

VIII. *An Account of the Management of* Aquatic Plants, *with Descriptions of several Species, now cultivated in England. By* William Kent, *Esq. F. L. S. &c.*

Read December 2, 1817.

Although aquatic plants are confined to few genera and species, at least those which are deemed worthy of cultivation, still their beauty, and structure, must be interesting, both to the horticulturist and the philosopher: their mode of growth precludes them from general observation, and, consequently, they vegetate, bloom, and fructify, almost unnoticed; but in the eye of the close observer of nature, their interest and attractive elegance are surpassed by no other tribe of plants whatever; there are few persons, whose delight is in the vegetable kingdom, and who have beheld them growing and flowering in perfection, but are desirous of adding them to their other botanical treasures, and ready also to bear testimony to their almost unrivalled beauty.

Having, for the last five years, paid particular attention to the culture of aquatics, I am anxious to communicate to the Horticultural Society, the mode I have adopted with the best success. To name every species would occasion frequent repetition, I shall mention, therefore, a few only; some, that require the protection of the stove and the greenhouse; and others, which are hardy. The genera I purpose noticing, are *Menyanthes, Nymphæa, Nuphar, Euryale,*

and *Nelumbium*, and the same treatment, if pursued with others, will prove equally satisfactory.

Of the first genus seven species are cultivated in England, but all except the first have of late received the generic name of *Villarsia*.

1. *Menyanthes trifoliata:* a British species; growing in bogs, and moist places, with a trifoliate leaf; bearing, in April and May, a beautiful spike of white fringed flowers. Figured in *English Botany, Plate* 495.

2. *Menyanthes nymphoides:* this is also a British plant; growing in ponds and still waters, spreading over them in every direction, and bearing yellow flowers at the end of the runners, and cordate leaves similar to the *Nymphæus;* flowers from June to September. Figured in *English Botany, Plate* 217.

3. *Menyanthes exaltata:* from New South Wales; leaves ovate standing upon footstalks, considerably above the surface of the water, (which should not be more than six inches in depth,) and producing a bunch of yellow flowers, on a scape about twice the length of the footstalks of the leaves; flowers from June to the end of the season. Introduced in 1805, and figured in the *Botanical Magazine, Plate* 1029.

4. *Menyanthes sarmentosa:* from New South Wales; leaves like those of a *Nymphæa*, but smaller, floating; the flowers yellow, on a scape, which rises several inches; grows in water, from nine to fifteen inches deep; flowers in May and June. Introduced in 1806, and figured in the *Botanical Magazine, Plate* 1328.

5. *Menyanthes ovata:* from the Cape of Good Hope;

leaves more oval than those of *Menyanthes exaltata,* but rising above the surface of the water, on footstalks; the flowers yellow, on a scape longer than the petioles of the leaves; it requires to be placed in shallow water; flowers in June and July. Introduced in 1786, and is figured in the *Botanical Magazine, Plate* 1909.

6. *Menyanthes Indica:* from the East Indies, and the Cape of Good Hope; leaves like those of *Menyanthes sarmentosa,* but of a bright shining green; the peduncles of the flowers are produced out of the petioles, near the base of the leaves, whence roots also are thrown out; flowers of a delicate pale yellow colour, growing in tufts, or bunches; thrives well in water three or four inches deep; flowers most part of the summer. Introduced in 1792, and is figured in the *Botanical Magazine, Plate* 658.

7. *Menyanthes trachysperma:* a native of North America; in habit very much like the last, bearing its flowers, which are white, in the same manner. Introduced in 1812, but has not as yet been figured in any Botanical work.

The two first species are hardy, and require no protection; the 7th stood out last winter, in the pond at the Apothecaries' Garden, Chelsea; the 3d and 4th did the same with me; but the season being remarkably mild, it might be wrong, on that account, to decide, that they are hardy; perhaps it would be best to remove them into the green-house, in a severe winter. The 5th requires this shelter, and will not live without it; and the 6th species needs the heat of the stove through the winter, but thrives and blooms best in a close frame, during the flowering season.

Of the second genus there are twelve species.

1. *Nymphæa alba:* a native of Britain; growing in ponds and streams; abounding in the river Roding, about three miles on this side of Ongar in Essex; with large, heart-shaped, floating leaves; bearing beautiful white flowers (with numerous petals) which also lie upon the surface of the water; flowers through the summer months. Figured in *English Botany, Plate* 160.

2. *Nymphæa odorata:* from North America; grows in ponds and flowing streams; it thrives best with us in shallow water, from six to twelve inches in depth; in habit and manner of growth, very much like *N. alba,* but on a smaller scale; the flowers are sweet-scented, and are produced during great part of the summer. Introduced in 1786, and is figured in the *Botanical Magazine, Plate* 819, and in Andrews's *Repository, Plate* 297.

3. *Nymphæa odorata, var. minor:* from North America; growing in the neighbourhood of New York; it is principally to be distinguished from the former by the smaller size of its leaves, which are also of a deep red purple underneath; it flowers about the same time, but does not bloom so readily. Introduced by Mr. Pursh, in 1812, and is figured in the *Botanical Magazine, Plate* 1652.

4. *Nymphæa nitida:* a native of Siberia; very nearly related to *N. odorata,* from which it differs most materially in the form of the root, which grows perpendicularly while that of *N. odorata* grows horizontally; like the preceding species, it has cordate floating leaves, and white flowers, borne on the water, which blossom at the same season.

Introduced in 1809, and is figured in the *Botanical Magazine, Plate* 1359.

5. *Nymphæa pygmæa:* a native of China; requires to be placed in shallow water, from four to six inches deep, although one, which fell into my pond, came to the surface from the depth of four feet and a half; it grows similarly to those already noticed, with heart-shaped, lobed leaves, about three inches in diameter, on foot-stalks proceeding from the root; the flowers, which are of a delicate white, seldom exceed two inches in breadth, and lie also on the water; it flowers nearly through the year. Introduced in 1805, and is figured in the *Botanical Magazine, Plate* 1525, as well as in the *Paradisus Londinensis, Plate* 68, where it is called *Castalia pygmæa.*

6. *Nymphæa lotus:* a native of Egypt, growing also at the Hot Wells in Hungary; it requires (to grow it well) about ten inches, or a foot, in depth of water, above the mud; the leaves and flowers of this species also proceed, on foot-stalks, immediately from the root; the leaves are shaped somewhat like those of the others, but are toothed on the margin; the flowers which are exquisitely white and delicate, stand above the water several inches, the petals lying at almost a right angle with the stalk; they continue to open about four days, beginning to expand early in the morning, and close about noon; the bud sinks under water, when the flower closes, and rises again, when it opens; it blooms but very sparingly, from June to September, Introduced in 1802, and is figured in the *Botanical Magazine, Plate* 797.

7. *Nymphæa pubescens:* a native of the East Indies; in habit very similar to the preceding, and thence called *Indian*

Lotus; the leaves are smoother on the upper surface, not so acutely toothed, and the petals of the flower more numerous; its blossoms open about midnight, and close before noon; it flowers from June to September. Introduced in 1803, and is figured in Andrews's *Repository, Plate* 391.

8. *Nymphæa rubra:* a native of the East Indies: requiring eight or twelve inches depth of water, above the mud, to grow it in any perfection: the leaves are of a dark reddish green, indented; the flowers of a rich crimson, with black anthers, elevated above the surface several inches; flowering early in the morning, and closing about noon, from June to September. Introduced in 1803, and is figured in the *Botanical Magazine, Plate* 1280, and in Andrews's *Repository, Plate* 503; also in the *Paradisus Londinensis, Plate* 14, under the name of *Castalia magnifica.*

9. *Nymphæa rubra, var. rosea:* a native of the East Indies; needing the same depth of water, as the preceding; and differing from it only in the colour of the leaves and flowers, the former being of a brighter green, and the latter having rose-coloured petals, with yellow anthers; flowering also from June to September. Introduced in 1803? and is figured in the *Botanical Magazine, Plate* 1364.

10. *Nymphæa versicolor:* a native of the East Indies; a free growing plant, which flowers constantly from June until October, and requires as great a depth of water, as any of the tender species; the leaves are dentate, their colour a grass green; the flowers open nearly white, with a reddish purple tinge, which increases till they fade; continuing open until two or three o'clock in the afternoon. Introduced in 1807, and is figured in the *Botanical Magazine, Plate,* 189.

11. *Nymphæa cærulea:* a native of Egypt, and of the Cape

of Good Hope; perhaps the most desirable of the whole genus, being a plant more easily cultivated, than others of the tender species; bearing several flowers at a time, in constant succession, of a fine sky-blue colour, which are very fragrant, commencing to bloom early in the season, and continuing when most of the others have ceased; leaves slightly dentate, of a pale green; flowers most part of the year. Introduced in 1792, and is figured in the *Botanical Magazine, Plate* 552, and in ANDREWS's *Repository, Plate* 197.

12. *Nymphæa stellata:* a native of the East Indies; with entire smooth leaves, and blue flowers, but not so large or of as fine a colour, and scent, as the last; neither are the petals so numerous; flowers through the summer. Introduced in 1803, and is figured in ANDREWS's *Repository, Plate* 330.

The first five species of *Nymphæas* may be deemed hardy, having lived, through several winters, in the pond, in my garden; but *N. pygmæa* flowers best, when treated more tenderly. It is worthy of notice, that the flowers of those, which are hardy, float on the water; while those of the tender ones, which are the remaining seven, are elevated several inches above it.

The third genus has four species; these formerly made part of the genus *Nymphæa,* but are now separated under the new denomination of *Nuphar.*

1. *Nuphar lutea:* a native of Britain; growing in rivers which are from three to ten feet deep; with ovate floating, lobed, leaves; the flowers yellow, buoyant on the surface of the water, and blossoming through the summer months. Figured in *English Botany, Plate* 159, as *Nymphæa lutea.*

2. *Nuphar minima:* growing upon Ivy Moor, in Perthshire, in a shallow pond, amongst decayed leaves; has much the habit of the former, but is decidedly distinct, and of

smaller growth; flowers through the summer. Figured in *English Botany, Plate* 2292.

3. *Nuphar Kalmiana:* a native of North America; unfortunately for the specific name of the preceding *(minima)*, is still smaller; thrives best in water, only three or four inches above the mud; leaves about two inches in diameter; flowers a bright yellow, with a crimson radiated stigma; blooms in July and August. Introduced in 1807, and is figured in the *Botanical Magazine, Plate* 1243, as *Nymphæa Kalmiana.*

4. *Nuphar advena:* a native of North America; a strong growing plant; the root extends a considerable length, and is about the thickness of a man's arm; the leaves are more acuminate than any of the Nymphæas, or other Nuphars, and are supported by strong footstalks, rather above the water; the petals yellow; the inside of the calyx is dark purple, approaching to black, which gives the flowers a rich appearance; leaves and flowers the size of *N. lutea;* requires from two to three feet of water; flowers about July and August. Introduced in 1772, and is figured in the *Botanical Magazine, Plate* 684, as *Nymphæa advena.*

All the Nuphars are perfectly hardy, and require no attention whatever, during the winter season.

The fourth genus consists of but one species.

Euryale ferox: a native of the East Indies; only an annual, though a most interesting plant, from the magnitude, and structure of the leaves, which have grown with me 30 inches in diameter; the ribs (more properly than veins,) on the under side, near the insertion of the footstalk, project half an inch, and are full of tubes, some of which, at the largest end, are the size of a crow quill; the leaves are nearly circular, lobed,

purple on the under surface, and the veins red on the upper, both sides closely set with strong prickles, they float on the water; the flowers are small, petals a fine purple; it requires room, to grow it well; from six to eight inches depth of water appears to be sufficient, but from the nature of the plant, deeper water would certainly be better; flowers through the summer. Introduced in 1809, and is figured in the ***Botanical Magazine, Plate*** 1447, but the figure gives a very inadequate idea of the plant; in Andrews's ***Repository, Plate*** 618, it is also figured, and is there called *Anneslea spinosa.*

This plant is tender, and needs the same degree of heat, as the other tropical aquatics.

The fifth genus has two species.

1. *Nelumbium speciosum:* a native of the East Indies; growing in slow-running streams and ponds: the flowers are said to vary from red to white, are fragrant, and in form something similar to a *Nymphæa,* but with a capsule of very peculiar construction, it being flat on the upper surface, with the seeds (which are large oval nuts) placed in separate cells, nearly half their diameter above it; the leaves are peltate, proceeding immediately from the root, and sometimes grow to the size of three feet; according to the description given in ***Exotic Botany***, and the ***Botanical Magazine,*** they rise three, or four feet above the water; and, from those, which have been grown in tubs, in our different stoves, this idea appears confirmed; but, in a descriptive catalogue of rare and curious plants, grown in India, published in 1773, they are mentioned as floating. I learn from Sir Joseph Banks, that in Batavia, the leaves float upon the surface of the ditches, but on the banks, into which the roots run, they are supported on

footstalks five or six feet high; flowers in July and August. Introduced in 1787, and is figured in *Exotic Botany, plates* 31 *and* 32, also in the *Botanical Magazine, plate* 903.

2. *Nelumbium luteum:* a native of America, growing in heads of water, reserved for the use of the river mills, in the states of Georgia and Carolina, and to the northward of which, Mr. Fraser says, he never found it, although in Pursh's *Flora of North America,* it is said to have been seen near Philadelphia; the leaves float, and are about eighteen inches in diameter; the flowers are yellow. This plant has not yet bloomed in England; and the time when it was first introduced appears uncertain.

The first species is decidedly a stove plant, and the second must, at least for the present, be deemed one also.

The hardy *Menyanthes, Nymphæas,* and all the *Nuphars,* require but little attention, except a regulation of the depth of water. They may be propagated by dividing the roots, with the exception of *Nymphæa nitida,* which, from its structure, forms no eyes, but can be raised from seed, if sown in water, as soon as ripe. This appears essential to obtain seedlings, with all the *Nymphæas* and *Nuphars,* although some few seeds may vegetate, if kept dry through the winter; but of this there is no certainty. *Nymphæa pygmæa* fructifies, and sows its seeds, which grow without any care.

For the purpose of growing these and other hardy aquatics, I have a small brick pond, 4 feet 6 inches deep, in the centre; round which runs a shelf, 2 feet wide, and 18 inches from the surface. In the centre are boxes standing, filled with mould, for the larger species; and on the shelf, I place the smaller ones, in pots of various sizes. Besides the pond,

I have a large cistern, 2 feet deep, formed, by divisions, into compartments, from one to two feet square, which are partly filled with mould, to different heights, according to the nature and habit of the plants. Every spring, the mould in the boxes, pots, and cistern is changed, and when the roots have filled any of them, they are divided: a strong rich loam, in general, suits best for all this tribe of plants.

Menyanthes Indica, Nymphæa Lotus, pubescens, rubra, rubra var. rosea, versicolor, cærulea, and *stellata,* also *Euryale ferox,* which are tender, I find thrive best in a close heat. The first needs only to be fresh potted, and placed in the frame, where it will grow, and flower the whole summer. In order to prepare the *Nymphæas,* the pots, in which they have been kept through the winter, are placed, early in April, in small wooden cisterns, 2 feet long, 14 inches wide, and 6 inches deep; and removed from the stove into any cucumber, or melon frames, which may be in use. In about a fortnight, or three weeks, a number of offsets, or runners, will be thrown from the bulbs. These are then separated, and put into small pots; and in the course of ten or twelve days, a strong plant of each species is selected, and placed in the cisterns, for flowering.

The tender aquatics, especially the *Nymphæas,* I grow in a brick three-light frame, 13 feet long, and 6 feet broad; inside depth, at back, 5 feet, and above the ground, 4 feet: which is filled with tan. I have four wooden cisterns, lined with lead, 4 feet long, 2 feet 6 inches wide, and 15 inches deep: these are plunged in the tan, and filled with strong rich loam, about 6 inches deep, the bottom part of which is rammed down; and the plants placed in them, one or two

in each, according to their habit of growth. The cisterns are then filled with water, by degrees. As the plants advance in size, they must be replenished, and cleared from confervæ, as often as necessary; and if they are occasionally watered, over their leaves, from a watering pot, through a rose, their vigour will be greatly increased. It is important to keep them in a constant state of growth: for if checked, they will form bulbs; and grow no more during the season. This will be caused by cold; but this year, the heat in June produced the effect, although they were shaded from the sun's rays, by matting, and the lights considerably raised. Where dung is used, there is like danger, from its heating. After being planted out, they will shew flowers, in the course of a month, and some of them will continue blooming through the season. As soon as the plants have done flowering, and perfected their seeds, they disappear, and form bulbs in the mud. These, in the month of October, I put into small pots (60 to the cast), and place them in a trough of water, in the stove, where they remain dormant until the ensuing spring. The seeds are most likely to vegetate, if sown at the same time, and treated in the same manner. *Nymphæ cærulea* will flower in the stove; but not so finely as in the frame. *Nymphæa stellata* seeds freely, but the root does not easily divide; indeed it is best grown, when treated as an annual. *Euryale ferox* does well under similar treatment to that of the *Nymphæas;* its seed should be sown about Christmas, and kept in the cistern of the stove.

The culture of *Nelumbium* is not so easily defined. Many persons, who have succeeded in growing, and flowering the first species, have lost the plant, during the winter. It is easily

raised from seed; which will retain its vegetative power for 40 years, and with every advantage, in a fair season, produce blossom the first summer. It is generally grown in large tubs, with a few inches depth of water over the surface of the mould, placed in the tan bed of the stove. By these means, I raised a fine plant last year: the seed was sown in May, and threw up several flower buds, which did not come to perfection, but most probably would have done so, had the seed been sown two months earlier. The leaves produced were about two feet in diameter; but the plant went off in the winter, notwithstanding it was treated in the manner hitherto found the most successful; which has been, to allow the tub to remain in the tan, and become nearly dry, giving it no more water, than the other plants around it. At Canton, it seems, they drain the ponds wherein it grows, and use the roots for food; but whether fibres of it are the parents of the ensuing crop, or the ponds are replenished by seedlings, does not appear. Both are probable, as the roots, which have been kept nearly dry in our hot-houses, if but a very small piece has remained alive, have become vigorous blooming plants, as well as those from seed.

Nelumbium luteum: of this but little account can be given. I have raised the plant from seed, and once succeeded in keeping one out of three, through the winter, by following the foregoing method. But it made but little progress, during the ensuing summer, and perished in the autumn. As a considerable quantity of seed has recently been brought over, it is to be hoped, we shall become better acquainted with the habit, and culture of both species.

IX. *On a Successful Mode of treating Fruit Trees, practised by Mr.* Charles Harrison, *Gardener to* James Stuart Wortley, *Esq. M. P. F. H. S, &c. of Wortley Hall, near Sheffield, in Yorkshire. By* George Henry Noehden, *LL. D. F. L. S. &c. Vice-Secretary.*

Read January 6, 1818.

There are, perhaps, few gardens, in England, where fruit trees, especially *Peaches* and *Nectarines*, are cultivated with more success, than in that of James Stuart Wortley, Esq. of Wortley Hall, in Yorkshire. The quantity of fruit that has been produced by the method, practised there for several years past, is spoken of by those, who have seen it, as very uncommon; and even in the last season, when fruit generally failed every where else, the produce of Mr. Wortley's garden was considerable. Nor is the quality of the fruit inferior to that of any other garden, so that, altogether, the mode of treatment, by which such plentiful crops are almost invariably obtained, must be excellent. The merit of it is, by Mr. Wortley, entirely attributed to his gardener, whose name (Charles Harrison) was mentioned upon a former occasion, when I had the honour of laying some information, upon this subject, before the Society.* My attention was again drawn to it, this autumn, by what I accidentally heard of the produce of that garden: and finding myself at no great distance from the spot, I determined to visit it, for the purpose of ascertaining the truth of the reports that had reached me, and of enquiring, as an

* See Vol. II. page 13.

eye witness, into the particulars, relating to the trees in question. I was the more inclined to do so, as I thought some farther intelligence might be necessary, in addition to the account before given, to set the matter in its true light. What was communicated in the Paper alluded to, was chiefly derived from a letter of Mr. Wortley's: what I now shall submit, is the result of my own observation, and of an interview I had with the gardener, on the 1st of November of last year.

It is not a matter of particular importance to specify exactly, what the trees, in Mr. Wortley's garden, have produced: for the fact may be considered as admitted, that their produce has been superior to that of other gardens. To this conclusion, at least, the testimony of many persons seems to point. I will, however, mention Mr. Harrison's numerical statements, as he made them to me, when I saw him, though I do not mean to lay any great stress upon them, in describing his method of managing his fruit trees, beause I think, this will recommend itself to the attention of the intelligent horticulturist, by the principles upon which it is founded, even without the exhibition of those splendid results. The number of Peach and Nectarine trees, in the garden, is altogether thirty-two; and they are trained on brick walls, which are partly provided with flues. From these trees, according to Mr. Harrison's account, eight thousand Peaches and Nectarines were gathered, in the last season; which crop, though sufficiently large, was much smaller, than what other years had afforded. The greatest, which the trees ever yielded, he estimated at seven thousand dozens, and this he referred to the year before last.

This remarkable success must depend upon two causes: first, an abundant production of blossom, and secondly, an infallible mode of preserving it. To these two considerations our attention will be directed. As to the first, we have to suppose, that the trees are sound, and planted in proper soil; the question then is, how are they managed, in regard to pruning and training? It is particularly in the article of *pruning*, that the individual alluded to excels. It differs very much from that, which is generally practised. His trees retain a vast quantity of wood: they are left in possession of their stout limbs, and large branches, or, as I may say, are suffered to keep a great deal of their timber, much more than is usual in common practice, where the heavy wood is, for the most part, cut away. Besides this, the growth of small shoots is encouraged, almost without limitation: they are tolerated, and saved, as long as the wall will hold them; but they are severely shortened by the pruning knife. They are cut down to about twelve buds, or even fewer, and only removed, when it is necessary to make room. The great branches are displaced for a similar reason, namely, when space on the wall is wanting; or when the old wood begins to be worn out, and suggests the expediency of a new succession. When the branches, or shoots, reach the full height of the wall, if they cannot be bent down, it is, of course, required to top them, in order to keep them within their proper limits. This mode of proceeding, I say, is different from the practice usually followed by gardeners, who make it a rule to clear away all gross wood, as by this means, they conceive, that fruitfulness is increased. When we reflect upon the subject, we shall perhaps be led to doubt, whether

the fierce application of the pruning knife, that cutting and maiming of the tree, the indiscriminate destruction of its great limbs, has not something unnatural in it. Those violent operations must, in some measure, derange, or unsettle, the organization of the plant. The sap, being deprived of its natural channels, must irregularly make way for its overflow, and spend itself in the production of new branches, instead of being employed in the formation of fruit. Art seems to have outstepped the line prescribed to it: for though it may advantageously assist nature, yet it should not be carried so far, as to appear in direct opposition to it, and to violate those laws, upon the observation of which success must depend. On these principles Mr. Harrison seems to act, and the result of his labours proves the correctness of the reasoning. The great branches, by claiming a considerable portion of nourishment, have the effect of moderating the sap, which circumstance is conducive to fruitfulness; and, at the same time, they serve as a basis to numerous small shoots, calculated for bearing fruit buds. The short pruning of these shoots, while it gives strength to the buds, which are suffered to remain, tends to form good young wood, that may be turned to account, in subsequent years. Trees, so managed, seem to thrive in health and vigour, and to make an ample return for the attention bestowed upon them. Every part appears to be productive, while no barren and luxuriant excrescences, nor water shoots, or useless twigs, are to be seen; and those expedients, which in other cases are resorted to, to modify the course of the sap, are not wanted, under circumstances like the foregoing.

So much was to be said about the pruning of the Peach

and Nectarine trees. What regards the training, unless the laying in of the wood, which has been adverted to, be comprehended under it, there is nothing particular in Mr. HARRISON's method. He follows the old plan of fan shape training, and attaches no importance to the horizontal position of the branches, which is, generally, considered as a means of promoting fruitfulness. As he attains that end by the other merits of his system, he can dispense with this accessary of art, though, if it were added to it, that system might perhaps be esteemed still more complete.

Before I proceed farther, I will notice the manner, in which he treats those fruit trees, which bear their fruit on spurs: such as the Plum, the Pear, and the Cherry. It is well known, that what gardeners term *spurring a tree*, gives rise, in time, to those knotty excrescences, which not only disfigure the tree, but prove injurious to its fruitfulness. The trees, under Mr. HARRISON's care, are totally without them; and, in lieu of them, are richly studded with young and healthy single spurs, which are not improperly denominated *natural spurs*, because they are naturally produced on the shoots, or branches, without the intervention of the pruning knife. The growth of these young spurs he encourages, not by topping, or pruning, an old spur, but by cutting it entirely away. The embryos of the young spurs, it seems, are scattered along the branches, under the bark, very frequently near the old spurs; and it requires only the removal of the latter, to make the young ones come forth. Mr. HARRISON, accordingly, cuts the old ones away, after they have once borne, and thus secures a constant and plentiful supply of young spurs. Such a spur requires one

season for its complete formation, and will yield fruit the next; and with judicious management, there will always be an abundant succession.

We now come to the second part of our subject, namely, the means, by which the blossoms of the trees are preserved. Without securing these, all the preceding speculation would be idle. The point, which principally enters into this consideration, is to counteract the effects of spring frosts; and the remedy, which Mr. Harrison employs, is watering the blossoms, after they have been exposed to a cold and severe night. By this, the injury, which the frost has done to them, is removed, and the organization, which had suffered, restored. The process has already been described, in the Paper before quoted; but it may, in a few words, be repeated. When the blossoms appear to be affected by the influence of a frosty night, cold water is thrown upon them, by means of an engine, syringe, or the rose of a watering pot; and this seems to extract the frost, and to retrieve the soundness of the blossom. The water, thus applied, probably serves as a medium between the chilling cold, and a warmer atmosphere, by which a transition from the one to the other is effected, and the equilibrium, necessary for the preservation of the flower, gradually re-established. The frost having violently acted upon its organization, if the opposite extreme were at once substituted, an entire destruction of it would be the consequence: but the cold water interposes between the sudden warmth, which would be pernicious, and affords it a slow and gentle passage, which enables the injured parts, by degrees, to recover. That this is the proper ground, on which to explain the matter, may be inferred from an

observation of our President's, who remarks,* that "*it is the transition from cold to heat, which usually destroys vegetables.* To which may be added, by way of illustration, the following statement, made by a foreign writer,† who speaks thus: "It is remarkable, how much cold and snow the common Lemons and Oranges will bear, at Rome, *provided they are planted in a sheltered situation, not much exposed to the sun.* Thus I saw, in the two winters of 1805 and 1806, under my windows, on Monte Pincio, three standard Orange trees, in the open ground, heavily covered with snow, for more than a week. The green leaves, but still more the golden fruits, nearly ripe, looked singular, but beautiful, amidst the snow: *neither fruits, nor trees had suffered, being in a sheltered place, while many branches and leaves of other trees of this kind, which were exposed to the sun, turned black and died, rendering the whole tree sickly.*" It hence follows that the operation must be performed, before the atmosphere becomes too warm, and, by all means, before the rays of the sun can reach the frost-bitten parts. The rule, therefore is, that it should, if possible, be done before the sun rises. Mr. Harrison regards this process of watering as indispensible to the success of his fruit: situated as his garden is, he says, he should have no means of preserving the blossom, without it. To himself, he declared, it had always answered: and he mentioned a gentleman in Yorkshire, who, having adopted it, at his recommendation, had derived from it the same advantage. If this be so, the practice is certainly entitled

* See Vol. II. page 305.

† Dr. Sickler, in his treatise on Orange and Lemon trees, written in German, with the title: *Der Volkommene Orangerie Gartner,* page 9.

to more general regard, than it has hitherto met with. It is attended with little trouble, or loss of time : a given number of trees are soon run over with the engine ; and half an hour, or even an hour, spent in this manner, may amply reward the gardener's labour.

Mr. Harrison has, in his garden, the benefit of a certain proportion of hot walls ; and he seems to make such use of them, in forwarding his fruits, as a good gardener should do. They are the best means of ripening the wood, which, in unfavourable seasons, is apt to remain too long green, and thus becomes unfit for perfecting the fruit. Some gardeners think, and I am myself friendly to this opinion, that that purpose is best attained by heating the walls in autumn, so as to have the wood in a state of readiness for vegetation, as soon as spring opens. Mr. Harrison, however, does not avail himself of this advantage, but defers giving artificial warmth to the trees, till spring. Perhaps this particular also might be added to his system, as an improvement. It is of importance to any vegetable production to receive the influence of the season, as early as may be ; and whatever can be prepared, with this view, in autumn, should not be delayed till the spring following. It is for these reasons, that autumn sowing and planting should, under circumstances, otherwise equal, be generally preferred. Upon a similar ground, I conceived, Mr. Harrison was so early with his pruning : for when I saw his trees, on the 1st of November, several of them had already undergone that operation.

X. *On the Cultivation of* Celery. *By Mr.* Daniel Judd, *F. H. S. Gardener to* Charles Campbell, *Esq. at Edmonton.*

Read February 3, 1818.

The Celery, which I exhibited, in the winter, to the Horticultural Society, having been approved of, and considered to possess more than ordinary merit, I beg leave to offer the following account of my method of cultivating it, which differs, in some points, from the usual practice.

The seed is sown about the middle of January, in a warm situation, on a very rich piece of ground, and is well protected, from the inclemency of the weather, by mats, at night. When the plants are from two to three inches high, they are pricked out into the nursery bed; and as I have found them much injured in their future growth, if the fibres of their roots become at all dry, I immerse them, when I draw them from the seed bed, in a little water, placed in a garden pan, so that they remain quite moist, whilst out of ground. The plants remain in the nursery bed, till they are fit for the final removal, being kept clear from weeds, and watered occasionally; but I do not consider them as fit to be transplanted, until they become very strong.

My ground for the crop is prepared by being trenched, two spades deep, mixing with it, in the operation, a good dressing of well reduced dung, from the old forcing beds; I give it a second trenching, that the dung may be the better

incorporated with the mould, and then leave it in as rough a state as possible, till my plants are ready to be put out.

In the ground thus prepared, I form trenches twenty inches wide, and six inches deep, at six feet distance from each other, measuring from the centre of each trench. Before planting, I reduce the depth of the trenches to three inches, by digging in sufficient dung to fill them so much up. At the time of planting, if the weather be dry, the trenches are well watered in the morning, and the plants are put in, six inches apart, in the row, in the evening, care being taken, by the mode above mentioned, to keep the fibres quite wet whilst out of ground; as they are drawn from the nursery bed, the plants are dressed for planting, and then laid regularly in the garden pan. The trenches, in which my rows of Celery are planted, being so very shallow, the roots of the plants grow nearly on a level with the surface of the ground; this I consider particularly advantageous: for as considerable cavities are necessarily formed on each side, when the moulding takes place, all injury from stagnant water, or excess of moisture, is prevented. The trenches, when planted, are watered as may be required.

I do not think it well, to load the plants with too much mould at first: the two first mouldings, therefore, are done very sparingly, and only with the common draw-hoe, forming a ridge on each side of the row, and leaving the plants in an hollow, to receive the full benefit of the rain and waterings. When the plants are strong enough to bear six inches height of mould, the moulding is done with the spade, taking care to leave bases enough to support the mass of mould which will ultimately be used in the ridge,

and still keeping, for some time, the plants in an hollow, as before directed. The process of moulding is continued, through the autumn, gradually diminishing the breadth of the top, until at last it is drawn to as sharp a ridge as possible, to stand the winter.

In the operation of moulding, it is necessary, in order to prevent the earth from falling into the heart of the plant, to keep the outer leaves as close together as possible. For this purpose, before I begin the moulding, I take long strands of bass matting, tied together till of sufficient length to answer for an entire row; and I fasten this string to the first plant in the row, then pass it to the next plant, giving it one twist round the leaves, and so on, till I reach the other end, where it is again fastened. When the moulding is finished, the string is easily unravelled, by beginning to untwist it at the end, where it was last fastened.

If I have spare room enough in my garden, I generally prepare my ground for the Celery crop, during the winter; and I avoid putting much of a crop in the space between the trenches, especially one that grows tall: for I find Celery does best, when it grows as open as possible.

XI. *On some Modes of continuing a Supply of* Young Potatoes, *through the Year. By* George Henry Noehden, *LL. D. F. L. S. &c. Vice-Secretary.*

Read February 3, 1818.

As the *Potatoe*, in its young state, is thought to be an object, very desirable for the table, the most convenient methods for obtaining it, in that condition, deserve to be noticed. Every one knows, that it undergoes a change, in its quality, and, consequently, in its taste, as it advances in age. When old, most of the varieties become mealy: while, when young, they generally have a closer grain, and approach to what is called a waxy texture. It is under these circumstances that it is often preferred, for the use of the table. It has, accordingly, become a practice with gardeners, to force the plant, by artificial means, at such periods, when common culture, in the open ground, could not produce it. The usual way is by hot-beds, on which it may be raised in winter, or early in spring. This process is attended both with trouble and expense, and is not within every body's reach; for which reason, any other mode, that would answer a similar purpose, in a cheaper and more easy manner, might justly be commended.

The Potatoe, from the abundant nourishment, which the flesh of the tuber affords to the embryo plant, has an extraordinary disposition to vegetate; and it seems to be

possible, to place it in such a situation, that the vegetating power, being prevented from exerting itself upwards, so as to form stem and leaves, should be employed in throwing out roots only, with their appendages. This, for example, may, to a certain degree, be effected, by laying up potatoes between strata of sand. In the corner of a shed, or other sheltered place, or in the cellar, spread a layer of sand, and upon this put some potatoes; cover them with sand, upon which place potatoes, then sand again, and so on, alternately, till you have formed your pile of the height and dimension, you designed. The top is closed with sand. The strata of sand may be two or three inches deep. In such a pile, the potatoes will emit roots and tubers, or in other words, will yield a young produce: and I am not aware, that there is any difference between the several parts of the pile; but the growing process seems to go on equally, near the top, in the middle, and at the bottom. Leaves and stems are not seen any where. It is only full grown and ripe potatoes, that are fit for this experiment, and such, in which vegetation is not impaired, by premature sprouting. Particular care, therefore, must be taken, to have a proper supply for the purpose. The old potatoes must be piled according to the time, when the young ones are wanted. These will be ready in December, if the pile be formed in August, and thus one month will correspond with the other. There can be no difficulty in admitting, that one sort of potatoe may be better suited to this operation, than another; and experience will soon point out that, which may be best calculated for it. I have heard the *Oxnoble* recommended; but it is probable, that other varieties may be equally fit for this

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use, or even superior. The produce, which is raised by this method, is, however, not spoken of, as very good : the young potatoes are generally of a loose texture, watery, and of indifferent flavour. This may, perhaps, be accounted for, from the want of suitable nourishment, that would give them proper consistency and quality. The sand can contribute little, or nothing, towards it ; and the young roots and tubers must be almost entirely fed from the juice and substance of the old. To this cause the defect, adverted to, appears to be referable. If art could throw in any thing, to supply what is wanting, good young potatoes might possibly be obtained. What occurs as the most likely means to accomplish this end, seems to be the application of a proper soil, or compost, in which the old potatoes might be imbedded, before the layer of sand is put upon them. Thence, I conceive, sufficient nourishment might be derived, for the due formation of the young tubers. As I only speak of this expedient, by way of speculation, without having as yet had an opportunity of trying it, in practice, I will not presume to lay down any directions for the proceedings to be adopted. Experience will soon afford the necessary instruction. If I were to make the experiment, I should proceed thus : put a layer of sand on the ground, as before directed, and upon this, the earth, or compost, two inches thick, in which the old potatoes should be bedded. When thus lodged, throw upon them a stratum of sand, on which lay again the earth, or compost ; plant the potatoes in it, cover them with sand ; and in this manner go on, making couch after couch, till the intended pile is completed.*

* Since I wrote the above, it is come to my knowledge, that young potatoes

Besides *producing young Potatoes,* I will mention a method of *preserving* them, as *such,* for winter use. By *young Potatoes,* I take for granted, are generally understood those tubers, which have not attained their full age and growth. In this stage, the substance is generally finer grained, and more cohesive, than when they are farther advanced: they are what is called waxy, and differ, in taste, from those which are full grown. If they could be preserved in this state, through the winter, for the use of the table, it would doubtless be an acquisition: and something of this kind I have seen attempted. When the general crop of potatoes was gathered, at the usual period of their harvest, in autumn, the small tubers, which are frequently disregarded, and left to their chance, were picked out, and collected. They were deposited in a box, between layers of sand, and thus kept till the month of December. At this time, the box being opened, they were found in perfect preservation, and fit to be dressed for the table. To give them all the appearance of young potatoes, in a side dish, the tender skin on them was to be preserved: for peeling them would have destroyed that effect. It was recommended, for that purpose, when they were to be used, previously to soak them, for a certain number of hours, in water, and then to toss, or shake them, in a piece of rough flannel or baize, between two persons, backwards and forwards, and rub them between the hands; by which

have been exhibited before the Society, which had been raised in a similar manner; and I have remarked, that those were found the best which had been grown in mould, or some sort of compost. Whence I draw the conclusion, that the quality of the produce will depend upon the nature of the soil, in which it is generated.

operation, the coarse outer covering is loosened, and the skin remains clean and delicate, so as to exhibit all the exterior of young grown potatoes. Upon trying them on the table, I found, that some had really the fine waxy taste of young potatoes; but that others, and perhaps the greater part, though resembling the former, in size and looks, had entirely the grain, and flavour of the old potatoes. That difference is undoubtedly to be ascribed to the different state of maturity, at which the one and the other had arrived. The mealy ones, though equally diminutive with the others, had, in fact, reached their full age, and possessed, accordingly, the qualities, which that age would give. Those of a waxy texture were, unquestionably, much younger, and had not come to maturity, when they were taken from the ground. They were in that condition, which, by the taste, determines the name of young Potatoes. If this be so (and every probability seems to attend the reasoning), it may be concluded, that it is feasible to preserve young Potatoes, in the manner described, if they be gathered young: but to distinguish those, which are so, in the common harvest, in autumn, from those, which only appear so, would be difficult. The idea, therefore, presents itself, of planting potatoes expressly for that use; which must be done at a later period, than this vegetable is usually planted: let us say, two months later, in June, instead of April. When the general crop is matured, and gathered in October, those will be still in their *young* state; their grain will be still fine, and their texture close: and if thus taken up, and preserved, according to the method suggested, it can hardly be presumed, that when brought to the table, in winter, they will be different, in

quality, from what they were, when they were reaped: they will, in every respect, be young Potatoes, probably not much inferior, if at all, to those raised on a hot-bed. For it does not appear, that this mode of keeping them has any effect in promoting their maturity, at least, not to any perceptible degree. The sand employed should be of as barren a nature as may be, and if possible, contain little or nothing of the vegetative stimulus. When the tubers are taken out of the ground, previous to their maturity, they will not readily sprout, or emit roots, which circumstance is a security for the success of the method in question.

I have thought it worth while to communicate these observations, though they are not supported by that experience, which would at once make them practically useful. It will, however, be easy to submit them to trial, and they may possibly lead to results which may give them some value.

XII. *On the* Aphis Lanigera, *or* American Blight; *with an Account of various Experiments for the Destruction of this Insect on Apple Trees.* *By Sir* Oswald Mosley, *Bart. M. P. F. H. S. &c.*

Read November 4, 1817.

Amongst the insects, which derive their sustenance from the vegetable world, there are none, perhaps, more prejudicial than the Aphides; scarcely a plant exists, which is entirely exempt from their ravages, or which is not infested by a species peculiar to itself. Whilst the singularity of their habits deserves the strict observation of the entomologist, the depredations they so widely commit, demand the most accurate attention of the horticulturist. In selecting one species, out of this extensive genus, as the subject of the present enquiry, I have been urged by a consideration of the alarming encroachments it is annually making on the luxuries, I may even say, on the necessities, of mankind; and although the few observations I am about to make, can tend but little to arrest its destructive progress, they may, at least, instigate others, better qualified, than myself, for such an undertaking, to investigate and discover the means of effecting that desirable purpose.

I have designated this species by the term *Lanigera,* or wool-bearing, which has been previously applied to it, by

Sir Joseph Banks, in the second volume of the *Horticultural Transactions, page* 162, because I could not find one more appropriate; but, at the same time, I must premise, that the characteristic, which gives rise to it, is not confined to this species alone. In its formation, it differs from the generality of these insects, by not possessing a horn, or process, on each side of the abdomen: the body is surrounded by bands nearly parallel to each other, commencing at the thorax, and terminating at the extremity of the abdomen. The colour of the full-grown insects approaches to that of lead, and of the youngest to that of amber; the antennæ, or feelers, are proportionably shorter, and the size of the body much smaller, than any other species of this genus; indeed, we might justly be surprised, that insects so minute, could effect mischief so extensive, if we were unacquainted with their amazing fecundity, and the means which they adopt, to procure their food. For the latter purpose, nature has furnished them with a proboscis, or snout, which, when they are not feeding, is extended in a horizontal position, along the belly, and between the legs; it is armed at the end, with a very fine, and sting-like point, which they have the power of projecting, or withdrawing, at pleasure; with this instrument, they pierce the sap vessels of the tree, and suck out the juices from thence, through the proboscis. They do not frequent the leaves, and tender shoots of the trees, as other species of the *Aphides* do, but they inflict a more deadly wound, by extracting the sap, as it circulates beneath the bark. Their snouts are not sufficiently strong to effect this purpose, by penetrating the outer bark, except at the knots and joints, where it is the thinnest; but they generally insinuate

themselves into the wounded parts of the tree, where the rough edge of the outer bark shelters them from the inclemency of the weather, as well as from the discerning eye of the gardener; here they pierce, in security, the inner bark, and make rapid progress in their work of destruction. Whenever an Apple-tree, however, is attacked by these insects, their secret operations are soon visible in the cankered appearance of the bark, the sickly aspect, and scarcity of the leaves, and the almost total want of blossom. Upon a closer inspection, their haunts are easily discovered, by the mealy web, in which they are enveloped. This web, when observed through a microscope, resembles an accumulation of the finest cotton threads; it appears to be produced, not only from the abdomen, but from each division of the bands, which surround their bodies; intermixed with it are an infinite number of small transparent globules, consisting of a viscid saccharine fluid, the voided excrement of these singular insects. In several other species, this excrementitious deposition is the cause of the phenomenon, known by the name of Honey Dew; but in this, the quantity of saccharine fluid produced, is comparatively trifling, or at least, from its local detention in the mealy web, we do not observe it displayed so evidently upon the surface of the surrounding leaves; sometimes, however, large pieces of the web, intermixed with it, fall down, and after a short period, produce a similar effect on the subjacent grass.

Whether this species derives its origin from a foreign climate, or whether it may be descended from an indigenous stock, having changed its habits by a change of food, I have neither the opportunity, nor the inclination to discuss. It is

sufficient for us to know, that the depredations it has committed, in our orchards, have been confined to the period of a few years; but that even in those few years, its increase has been so rapid, and the injury it has caused, in many cases, so fatal, as to call forth the most anxious enquiries after some mode of destroying it, and rescuing our Apple-trees from its baneful attacks. To effect this desirable purpose, has been the object of different experiments, which I have tried, during the two last summers, on several trees. I directed one to be washed with a strong infusion of sulphur, in soap suds, which was forcibly thrown upon the insects from a garden engine; a temporary stupor seemed to affect them, in consequence, but no greater, than I had previously observed a violent shower of rain to produce upon them. I applied a strong decoction of tobacco leaves, in a similar method, to another tree, but with no better success. In hot-houses, I had frequently seen the destructive effects of the smoke of tobacco upon insects, but I found considerable difficulty in applying it to trees in the open air, so as to keep it sufficiently compressed, to answer the purpose. Having ignited the dried leaves of tobacco, in an empty flower-pot, and applied a pair of bellows to the hole at the bottom of it, my gardener bound the mouth of the pot to the bough of the Apple-tree with a wet napkin, which prevented the fumes from escaping, whilst the operation of the bellows directed them to the parts affected. The success of this experiment was much more complete, than that which had attended the others: great numbers of the insects perished, but some few, to my great surprise, survived, even after the most careful application of it. Upon

the whole, we did not think, that the advantages gained were commensurate with the trouble of the operation, and we determined to resort to some more effectual and less tedious process.

When the smallest quantity of oil was dropped, from the point of a pin, upon a single *Aphis*, I perceived that it caused instant death; this encouraged me to repeat the experiment on a larger scale. With a painter's brush, we applied *train oil* to those parts of the tree, which were infested by the *Aphides*, and the result of such application exceeded our most sanguine expectations. It not only effected their destruction at the moment, but we had the satisfaction of observing that every place, which we had besmeared with oil, during the last summer, had been cautiously avoided by the insects, during the present, although they were still visible on other parts of the same tree. The only doubt, which suggested itself to my mind, was, whether the oil might not be injurious to the tree; but the very reverse appeared to be the fact: for wherever the tree had been deprived of its bark, this application had preserved the albumen from the effects of the weather, and the young bark was gradually closing over the wounds. Perhaps, had the whole of the outer bark of the tree been smeared with oil, it might have proved injurious, by obstructing the pores, and preventing them from imbibing moisture from the atmosphere (as we know that the oiliness of the wool of sheep is often prejudicial to the trees against which they rub themselves); but no mischief can occur, from its application being confined to such parts only, as are attacked by insects. From the comparative cheap-

ness of linseed oil, I was induced to dress several trees with that, instead of train oil; but I found, to my disappointment, that the application of the former was not equally efficacious. Where the rugged edges of the old bark project over the parts infested by the insects, it may be necessary to pare it off, with a sharp knife, previously to the application of the oil; otherwise the brush might fail of reaching their most secret recesses.

Even after this application, however, the patient labours of the horticulturist may frequently be frustrated, and the same tree be found, in other parts, subject to the reiterated attacks of these insects, in the succeeding year. Nothing but the most accurate attention can exterminate this pest, when once it has been suffered to increase, by temporary neglect. Numbers of the insects will be washed off by heavy rains, and will crawl along the ground to the roots of the tree, where they will again commence their destructive operations, either by attacking the tender fibres, or by re-ascending the trunk, in search of a more convenient station. Perhaps the most effectual remedy, against this recurrence of their attacks, would be, to expose the upper part of the roots to the winter's frosts, and to apply to them, early in the spring, a mixture of night soil and lime, at the time they are again covered over with mould. But it will be left for experience to ascertain how far this, or any similar proceeding, that is attempted, may be conducive, or prejudicial, to the general health of the tree.

Since the above observations were made, I have received a communication, on this subject, from an intelligent corres-

pondent, Mr. Michael Walton, of Liverpool, who has resided many years in the United States of America, where he states the following remedy to have been used with success, in the destruction of this insect.

"Before the sap leaves the root, take the earth from around the tree, at least for one foot and a half, and half a foot deep. Mix a quantity of coal soot with fresh rich mould, and fill up the hole again. Be careful to carry off the old earth, and to burn it, lest the insect should be generated in it by the heat of the sun."

Note on the Insect by William Elford Leach, *M. D. F. R. S. &c.*

The animal, of which so accurate an account is given in the preceding Paper, is the *Aphis Lanigera* of Hausmann; it is described, by that author, in Illiger's *Magazine* for 1802, *page* 440, and is referable to Latreille's third division of the genus *Aphis*, but which division I consider to constitute a peculiar genus distinct from *Aphis*, and which I have named *Eriosoma*.

Eriosoma has its body covered by woolly matter; its abdomen has neither horns nor tubercles; and its antennæ are short. The body of *Aphis* is naked; its antennæ are long and setaceous; and the abdomen is furnished with a tubercle, or horn-like process, on each side.

Since all the *Eriosomata*, as their name imports, have their

bodies covered by woolly matter, the term *lanigera* is objectionable in a specific sense; the name *Mali* might therefore be substituted for it: and as this species occurs principally on the *Pyrus Malus,* I therefore propose to call it *Eriosoma Mali.*

XIII. *Note on Sir* Oswald Mosley's *Paper, on the* Aphis Lanigera. *By* Alexander Seton, *Esq. F. H. S. &c.*

Read March 3, 1818.

I have been in the practice, for some years, of using tar, for the destruction of this insect, by putting it, with a painter's brush, over the parts of the stem and branches, where the animal appears. This I have found to be completely effectual, and it operates, no doubt, in the same manner as the oil, by excluding the air, and involving the insects in a mass, from which they cannot extricate themselves. It may be a proper subject of experiment to ascertain, which of the two methods answers best. I should suppose, that the tar would be more lasting in its effects, than the oil, and that it would more completely destroy any young insects that might be produced from the latent eggs, a considerable time after the application. It is to be observed, that tar will destroy the leaves and the young shoots, which are in an herbaceous state, where it touches them; but I have never found it to be injurious to the ligneous parts of the tree. It is, indeed, an excellent salve for the wounds produced by the amputation of branches; though, for this purpose, I deem Forsyth's composition of cow-dung and ashes preferable, in such situations, as admit of its being easily attended to, and renewed.

XIV. *On the best Mode of Pruning and Training the* Mulberry Tree, *when trained to a wall, in a cold climate. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read January 6, 1818.

Mr. Williams has given some very excellent directions for the management of the Mulberry tree, when trained to a wall, in the second volume of the *Horticultural Transactions*, page 91, and in the cultivation of that, as of other species of fruits, he is most eminently successful. His tree is suffered to protrude its bearing branches, as spurs, several inches from the wall: and in the soil and climate of Pitmaston (both of which are extremely favourable), the fruit ripens in great perfection, and abundance. But in cold situations (and it is chiefly in such that the Mulberry tree will be found to deserve a place upon a south wall), little fruit will be produced, and that will ripen but ill, unless the bearing wood be brought closely into contact with the wall; and the great width of the leaves, and vigorous habit of the tree, present some difficulties to the cultivator, when this mode of training and pruning is adopted. It will be found necessary to diminish the luxuriant growth of the tree, and at the same time to increase its disposition to bear fruit. Such effects, may, however, be readily produced by several different means; by destroying a small portion of the bark, in a line extending round the trunk, or large branches, or

ringing, as described by Dr. Noehden, in the second volume of the *Horticultural Transactions*, page 262; by tight and long continued ligatures, or by training the bearing branches almost perpendicularly downwards. I have adopted the last mentioned method; because it greatly increases the disposition in the tree to bear fruit, without injuring its general health, and because it occasions a proper degree of vigour to be every where almost equally distributed. I believe, gravitation to be the beneficial agent in this case, upon evidence, which the reader may find in the *Philosophical Transactions* of 1806; and I have, of course, adapted my mode of training to my hypothesis.

My garden, at Downton, contained six years ago, two Mulberry trees, which had been trained, more than twenty-five years, upon a south, or south-east wall, in the usual fan form, and had each extended nearly thirty feet in width, and thirteen in height, without having ever produced fruit of any value, except small quantities, near the extremities of their horizontal branches. At that period, I cut away all the larger branches, except three on each side, leaving one on each side to extend its whole length upwards, with an elevation of about 45 degrees, another with an elevation of 30, and another of 15 degrees. As much of the young and slender wood of these large branches was preserved, as I found practicable; and the whole of this was trained nearly perpendicularly downwards; with the exception only of a small part, near the tops of the most upright large branches, which was bent inwards on each side, with a considerable inclination downwards, to occupy the central part of the space allotted to each tree. In the first succeeding year, I had necessarily

a small crop only; but in every subsequent year, my trees have borne well, except in the last season, when, owing to the badness of the preceding summer, a small quantity only of blossoms appeared in the spring. By bringing much of the bearing wood into contact with the wall, by the means above mentioned, I have had Mulberries ripe as early as the 20th July; and the crop continued successively to ripen, in much perfection, till the end of October.

As the blossom buds of the Mulberry tree cannot be readily distinguished from others, in the winter, the best period for pruning is, when the blossoms first become visible in the spring; and it is my practice to pinch off every barren shoot, which is not wanted, to cover the wall, and to stop every bearing shoot, under similar circumstances, at the third or fourth leaf. Mr. Williams has stated, that the bud immediately below the point, at which a bearing or other branch is pinched off, usually affords fruit in the following year; and I have found his observation in this, as in all other cases, to be perfectly accurate.

If I were now to plant Mulberry trees, I should wish to obtain such as had stems three or four feet long, as the first shoots of these, after being planted, might conveniently be trained downwards; and if plants of this height, previously propagated from bearing branches, were selected, I do not entertain any doubt, but that fruit might be obtained, in the second year after planting: and by proper attention, to shorten and renew the dependent bearing branches, such trees might easily be very long retained, in an almost equal state of perfection.

The Mulberry, as Mr. Williams has remarked, is a

much superior fruit, both in richness and flavour, when ripened upon a south wall, than upon a standard tree, even in situations, where it ripens well, under both modes of culture; affording an exception, I believe, to all, or almost all, other fruits, to which the wall gives increased bulk and beauty, at the expense of richness and flavour.

XV. *On the Cultivation, and the Varieties of the* Portugal Onion. *In a Letter to the Secretary. By* James Warre, *Esq. F. H. S. &c.*

Read February 3, 1818.

Dear Sir,

As I frequently have recommended gardeners in England to transplant their Onions, in order to improve their quality, and increase their size, I observed, with pleasure, in a Report of the Horticultural Society of Edinburgh, that Mr. Mac Donald, of Dalkeith, had there practised that process, with great success, and had exhibited a specimen, which was much approved of by that Society.

I now do myself the honour of offering to the Horticultural Society of London, a sample of Portugal Onion seed, from *Viauna,* in the province of *Minho,* and of communicating, at the same time, an account of the different sorts and qualities of the Onion in Portugal, and of the practice, there adopted, in its cultivation.

There are several kinds, or varieties, of Onion, in Portugal. Those imported into this country, are principally from Oporto, Lisbon, and Setubal.

Onions from Oporto. These, generally, are grown from Viauna seed: they are not so large, or mild, as those in many other places, but are a sound, firm bulb, that keeps well.

Onions from Lisbon. A fine, large, mild sort, usually inclining to the shape of a cone.

Onions from Setubal. Very fine, large, and mild ; in form nearly flat ; principally exported through Lisbon.

The Onions from Setubal and Lisbon, have very fine, thin, outward skins, which easily flake off, being loose, or shrivelled round the crown ; and are of a light, bright, shining, brown colour. The *Silver Onion* (of which the outer skin is nearly as white as milk) is a common variety, in many places. It is very mild, and grows to a good size, but does not keep, nor bear transporting well. In the *Alto Douro, Beira, Coimbra,* and the interior of the country, there are very fine large Onions, which, however, cannot be considered as distinct varieties, their size and quality depending chiefly on the soil, and mode of cultivation. At *Ovar*, which is near the sea, and has a very sandy soil, a small hardy Onion is produced, which is, in size and flavour, much like the common Onion of this country. It keeps through the year, but is not worth importing. At that place, a great deal of Garlic is grown, for exportation to Brazil, which is much esteemed, and of a comparatively mild flavour. It may be worthy of remark, that in those small Onions, which have the crown or top, and the outward skin thick, and tinged, or rather veined, with green, the taste and flavour is much less mild, and they are apt to affect the stomach.

The general practice of cultivating the Onion in Portugal is : to sow the seed very thinly, in November or December, on a moderate hot-bed, in a warm situation, with a few inches of rich light loam upon it, and to protect the plants from frost, by mats and hoops. In April or May, when they are about the size of a large swan's quill, they are

transplanted, on a rich light loam, well manured with old rotten dung. The mode of transplanting is particular. The plants are laid flat, about nine inches asunder, each way in quincunx, the beard of the root, and part only of the plant, lightly covered with very rich mould, well mixed with two thirds of good old rotten dung. This compost is slightly pressed down on the plant; water is given, when the weather is dry, until the plants have taken root. Subsequently, the earth is occasionally broken around them, by slight hoeing, in which operation care is taken not to wound the bulb. Weeding is diligently attended to, and the watering continued, according to the state of the weather. In Portugal, the means of irrigation are easy, the effects of which are particularly beneficial to the Onion: for, by letting the water filter, or pass, through small heaps of dung, placed in the alleys of the beds, a very rich liquid flows in upon the plants. The dung, as it is exhausted, or washed away, should be renewed; and the water must be checked in its current, so that it may gently spread over the surface.

When the Onions are ripe, they are drawn up out of the ground, and a twist is given to the top, so as to bend it down. They are left on the ground to season, before they are housed; then, immediately platted with dry straw, into ropes, or strings, of 25 each, and hung up to dry. They are not permitted to sweat in a heap. Their keeping well depends greatly upon the weather being dry and favourable, when they are brought into the house, and also upon their being carefully handled, and not bruised. In this country, I have practised, with much success, searing the roots, with a hot

iron, for the purpose of preserving the onions, which checks their sprouting ; and they should be kept in a dry, airy place.

With sentiments of great esteem,

I have the honour to be,

Dear Sir,

your very faithful and obedient Servant,

JAMES WARRE.

Great George Street,
January 12, 1818.

XVI. *Some Observations on* Celeriac, *with Directions for its Cultivation.* *By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read March 3, 1818.

The *Celeriac,* though noticed in most of our Gardening Books, is very seldom to be found in cultivation; and even where attempts have been made to grow it, they have generally failed. The French, who describe it under the name of *Celeri-Rave,* seem to be also without a proper knowledge of its management: for their accounts of it, as a vegetable, are equally defective with our own. It is amongst the German gardeners, who call it *Knoll-Sellerie,* that this plant is brought to a great size. By means of an importation from Hamburg into our market, we have, this winter, had an opportunity of seeing how different it is, when properly treated. Some of the roots, which were lately exhibited to the Society, and which were a part of those imported, weighed two pounds each, and were, on an average, fifteen inches in circumference; but I have reason to believe, that this was the effect of extraordinary rich soil, and that the usual size is about half of what is above stated, and then the roots are always quite solid, not hollow as some of these large ones proved.

The *Celeriac,* like the common white and red Celery, is derived, by cultivation, from the *Apium graveolens,* which grows in different parts of Europe, and in England also, in

wet ditches, and watery places. In its wild state, the herb is peculiarly acrid, and disagreeable to the taste; but the improved varieties have lost these noxious qualities, probably, in a great measure, from their being cultivated without excess of moisture. The *Celeriac*, however, when very large, I have found, if eaten raw, retains its hurtful properties: in those countries, therefore, where it is much used, as a vegetable for the table, it is always previously boiled.

I have been favoured, by Earl STANHOPE, with the following account of the cultivation of this root, in the neighbourhood of Dresden; in which it will be observed, that the peculiarity of the treatment consists in the frequent application of water, the omission of which may have caused the failure of former attempts, to bring the plant to perfection, in England. It requires a rich, well manured soil; and the seeds are to be sown in February, or March, on a hot-bed, under glass; and the plants are to be removed, in April, when they are two or three inches high, to another hot-bed, and set one inch and a half apart. In the beginning, or middle of June, they are transplanted into a *flat* bed, in the open air, at the distance of 15 inches from each other, and not in trenches, like other Celery. They must be abundantly watered,* as soon as they are set out, and the watering must be repeated, every other day, or, if the

* Since this Paper was read to the Society, Mr. HUNNEMAN has informed me, that, in the ordinary cultivation of the plant, in Germany, it is not watered more frequently than other vegetables; but then it does not attain the size, that I have described. He considers the plan of giving excess of water as peculiar, and that the vigorous growth of the plant is more dependant on richness of soil, than on any other cause.

weather should be warm, every day. As they increase in size, they will require a greater quantity of water, and they must be occasionally hoed. The roots will be fit for use in September or October.

The Celeriac is excellent in soups, in which, whether white or brown, slices of it are used as ingredients, and readily impart their flavour. With the Germans, it is also a common sallad, for which the roots are prepared by boiling, until a fork will pass easily through them: after they are boiled, and become cold, they are eaten with oil and vinegar. They are also sometimes served up at table, stewed with rich sauces. In all cases, before they are boiled, the coat, and the fibres of the roots, which are very strong, are cut away; and the root is put in cold water, on the fire, not in water previously boiling.

XVII. *Memoranda respecting the Culture of* Fig Trees, *in the open air, in England.** *Drawn up at the desire of the Right Honourable Sir* Joseph Banks, *Bart. G. C. B. By the Right Honourable* William Wickham.

Read February 3, 1818.

The *Fig Tree* is distinguished from most, if not from all other trees, by this extraordinary property, that it bears, and, in warmer climates, brings to maturity, in every year, two successive and distinct crops of fruit, each crop being produced on a distinct set of shoots.

The shoots, formed by the first, or spring sap, put forth figs at every eye, as soon as the sap begins to flow again in July and August. These Figs, (which form the *second crop* of the year) ripen, in their native climate, during the course of the autumn; but rarely, if ever, come to perfection, in England, where, though they cover the branches in great abundance, at the end of that season, they perish, and fall off, with the first severe frosts of winter. The shoots, formed by the second flow of sap, commonly called *Midsummer shoots,* put forth figs in like manner, at every eye, but not until the first flow of sap, in the following spring. These last mentioned figs, which form the *first crop* of each year, ripen, in warmer climates, during the months of June and July, but not in this country before September or October.

In warmer climates, indeed, very little attention is given to this *first crop,* because the midsummer shoots, on which

* See Note A.

it is borne, are commonly in the proportion only of one to six or eight, in length, when compared with the shoots of the spring, which produce the *second crop;* and the crop itself is always small, in the same proportion. But in England, it is the reverse. As no care or skill of the gardener can ever insure a *second crop* of *ripe* figs, in the open air, his chief attention must be directed to the *first*, and, consequently, to the means of obtaining the largest possible supply of midsummer shoots, being those, on which alone the first crop is produced. Now, though it may be beyond the gardener's skill to add to the positive length of the midsummer shoots, on any given tree, yet, by a very simple process, he may increase the proportion, which they bear to the spring shoots, both in number and length.

Suppose a fig tree trained,* as we often see them, at the end of winter, and beginning of spring, on the walls of the gardens and buildings, in the neighbourhood of London, i. e. the branches, in great number, neatly arranged, close to each other, the fore-right shoots pruned away, or cut very short, and the extremities of the branches (when the space will admit of it) preserved uncut, and nailed to the wall; it is obvious, from what has been already explained, respecting the manner, in which the fig tree bears its fruit, that no figs can be ripened, though many may be produced, on branches so trained, *except at their extremities;* because, when the gardener shortened the foreright shoots of these branches, at the winter pruning,† he necessarily cut away that part of them, which had grown after midsummer, on which part alone, a *first crop of Figs,* i. e. a crop capable of ripening in England, could have been produced. On the other

* See Note B. † See Note C.

hand, where the extremities of the branches had been trained in at full length, fruit capable of ripening, in this climate, would be produced on them, in the summer, just so far back from each extremity, as the point where the spring shoot of the last year ended, and the midsummer shoot commenced. Now, suppose that, instead of pruning and training the tree, in the manner just described, the gardener had, at the winter pruning, cut away every other branch, close to the stem, and trained in the remainder, with their foreright shoots uncut; if he had then bent back and nailed these shoots, all at their full length, close to the wall, along the intervals formed by cutting away the alternate branches; it is evident, that he would have preserved all the midsummer shoots of the preceding year, for which, in the existing state of the tree, he could have found room, so as to be able to nail them close to the wall, and by so doing, it is equally clear, that he would have secured a growth of figs, *capable of ripening*, at the extremity of each foreright shoot, as well as at the extremity of each branch. It is quite necessary that these shoots should be nailed back close to the wall, because (except in some very favoured situations) there exist, in this climate, no *certain* means either of procuring figs capable of ripening, or of bringing them, when procured, to full maturity and flavour, but, by keeping the wood, on which alone such figs can be produced (i. e. the midsummer shoots) quite close to the wall, not only during the first winter, but through the whole of the succeeding summer months.

By due attention to the principle, on which this mode of pruning and training depends,* it may easily be continued through succeeding years. It will be sufficient, at the winter

* See Note D.

pruning, which should always take place as early as possible, i. e. before the first severe frosts, to continue the practice of cutting clean out, from the parent stem, so many of the branches, as will leave room to train in, along the vacant spaces, caused by their removal, a large supply of foreright shoots, training them all at their full length, so as to preserve, carefully, the latter growth of wood (i. e. the midsummer shoots) at their extremities, and never, on any account, shortening a shoot of the preceding summer, except where a fresh supply of branches may be wanted to fill the wall.

It is obvious, however, though a moderate supply of ripe fruit may thus be obtained, that a large portion of wood, viz. the whole of the spring growth of each foreright shoot, thus trained in, will have been preserved to no useful purpose, but that of supporting a very short piece of bearing wood (i. e. the little midsummer shoot) at its extremity. This is an evil that does not admit of any remedy for the first year; but, in the course of that year, effectual provision must be made against its recurrence. For this purpose, as the foreright shoots, that have been trained in, shall, in their turn, during the spring and early summer, throw out shoots of the same description, the gardener must, in the course of the month of June, break several of them in succession,* as they nearly attain their full growth, and just as the spring sap in each begins to abate something of its full vigour. He should break them at moderate distances (6 to 15 inches, according to the strength of each shoot) from the place whence they severally spring, taking care that enough of the shoot be left to admit of its being bent back, and nailed close to the wall,

* See Note E.

at the ensuing winter pruning, and that one eye, at least, be left uninjured by the fracture ; and always preserving a quantity unbroken, sufficient to keep up a future supply of branches and wood.* The shoot may be either broken short off, or left suspended by a few ragged filaments, which may afterwards be separated with a knife, when the spring sap had ceased to flow. The former mode is less unsightly, and will therefore be generally preferred, by the gardener; but the latter has been found more successful, in practice. It is of consequence, however, to the full success of this system, that the shoots should be *broken,* and not cut. If left to their natural growth, or shortened by a sharp smooth cut with a knife (instead of a fracture), they would produce, at their extremities, only one single midsummer shoot, being a simple prolongation of the wood, formed in the spring: but when the shoot is *broken* at the time, and in the manner above described, it generally happens that, on the second flow of sap in July, two or three, or more shoots (forming a kind of stag's-horn) are pushed from the fractured part, instead of one: and it is hardly necessary to add, that each of these, according to its length, will produce several figs in the ensuing spring (making the *first crop* of that fruit) all of them capable of being ripened by our ordinary summer and autumn heats. It will require attention, on the part of the gardener, to break the shoots, each at its proper moment.† If the fracture be made too soon, the spring sap, continuing to flow, will form the rudiments of early second shoots, that will put out figs before the winter, all of which will be infallibly cut off; if too late, the shoot itself will perish, from not

* See Note F. † See Note G.

having had time to ripen, and become hard before the return of winter. Care also will be required in the manner of making the fracture, because, if the wood be split back to the parent branch, the whole shoot will die, or if the bark be torn further back than the first eye, no midsummer wood whatever will be produced from it, that summer, nor any spring shoot in the following year.

A sufficient supply of midsummer shoots being thus procured, during the summer, room must be made for them, at the succeeding winter pruning, by cutting away so much of the old wood, as will admit of their being all trained in, at full length, and nailed close to the wall, which should always be done before the first severe frosts. Keeping this object in view, the knife cannot well be used too freely in cutting away the old wood, nor is there any reason to fear, that its free use will either injure the future crops, or deprive the tree of its regular supply of branches. The midsummer shoots being trained in, each of them will produce, in the following year, one spring shoot, at least, at its extremity, whilst another will rise from each eye of the remnants of the old spring shoots that had been preserved in the manner above described, when these shoots were broken in the preceding month of June. From this fresh supply, by pursuing the system here explained, either wood or fruit, or both, may be obtained, for the succeeding year, at the discretion of the gardener. Where he wishes for wood, he must suffer these new shoots to grow to their full length; where fruit, and not wood, is desired, he must break them in the month of June, in the manner, and with the precautions, that have just been minutely explained.

It will be generally found adviseable, to give some shelter to fig trees, during the winter, more particularly so, where this mode of *pruning* is adopted, because the midsummer shoots, from being produced so much later in the season than those of the spring, remain, at the approach of winter, more soft and tender, and, consequently, less able to bear the immediate action of severe frost. In this respect, much must be left to the care and skill of the gardener, whose precautions must be determined, as well as varied, by the situation, aspect, and local shelter belonging to each particular tree, and by the varying temperature of each particular winter; it may, however, be laid down as a general rule, that the covering, where used, should be as thin and light, as a due consideration of all the above circumstances will admit, and that it should generally be removed in the day time, and always on the return of moderate weather. In considering this last part of the subject, it will hardly escape observation, that the mode of *training* here recommended, furnishes of itself, considerable protection against the severity of winter, by keeping the shoots close to the shelter of the wall, at the same time that it materially contributes to the perfection of the fruit, as well as to its more early ripening.*

* See Supplementary Note.

Additional Remarks.

Note A.

It is not supposed, that these memoranda contain any thing positively new. All the detached parts of the system, here explained, are known, and may be found partly in books, partly in actual practice, as well in the northern parts of France, and in Holland, as in Great Britain. It does not appear, however, that any general, and at the same time, practical view of the subject, *with reference to the particular mode of bearing of the Fig tree,* has hitherto been published.

Note B.

This example has been chosen, as of a form of tree, the most difficult to bring at once to a better system of pruning and training. It will be easy to apply the principles, here stated, to any tree less injudiciously trained and pruned; and still more so to young trees, with their heads not yet formed, remembering always, that in trees, planted in corners, the branches must be trained vertically, and the shoots horizontally: on the contrary, where a large space of wall is allotted to a single tree, the branches must be trained horizontally, and the shoots vertically. It is, of course, not intended to use these words in their strict sense, but only to say, that the shoots and branches respectively, must in the one case approach to a vertical, in the other to a horizontal direction.

Note C.

The foreright shoots are sometimes pruned short, in the

hope of procuring what are called fruit spurs, along the whole extent of the branches; but this mode of bearing never takes place in the fig tree, though the short midsummer shoots have often so much the appearance of spurs, as to deceive any gardener, not well acquainted with the natural habit of the tree, and the very peculiar manner, in which its fructification is effected.

Note D.

Where there is a large extent of wall, covered with fig trees, it might, perhaps, be the safest way, to rest contented with the mode of pruning and training, here first described. It will insure a moderate, but nearly certain supply of fruit, *capable of ripening*, and will require much less attention, and labour, than the part of the general system, next about to be explained, and recommended; but, besides that it will necessarily furnish a much less quantity of fruit, from any given space of wall, it is open to this further objection (which in this climate is a very serious one), viz. that the foreright shoots of the year, if left at their full length, on the branches, and not broken in the early part of summer, will cause so thick a shade, as materially to retard the ripening of the fruit, on the wall behind them.

Note E.

This mode of breaking the shoots, in June, is more particularly recommended to those, who have only small gardens, and who can attend to the operation, or rather, who will undertake to perform it, themselves. It has, indeed, this great advantage, to gardens so circumstanced, that it will

procure more fruit, *capable of ripening*, on trees of equal size, than can be obtained, in the open air, by any other method; or, what is in fact the same thing, it will give an equal quantity of fruit, from a much less space of wall. But it should not be attempted by those, who have a large extent of wall, covered with fig trees, unless they can make up their minds to allow their gardeners some additional assistance, for this express purpose, during the month of June.

Note F.

There is no mischief to be apprehended from what will necessarily cause some alarm, at the beginning of this operation, viz. the abundant flow of the milky juice, from the broken shoots. The ground has been seen quite white, under the branches, with the exuding sap, without any consequent damage either to the tree itself, or to the subsequent crop of fruit. Perhaps, however, the best and safest mode of proceeding, is to combine the two parts of the system, by reserving some shoots to be trained in, at full length, and breaking only the remainder.

Note G.

It will probably be here observed, that the same result, viz. a plentiful *first crop* of figs, may equally be obtained by a very opposite system. It is, indeed, a common saying among the gardeners, on the south and west coasts of England, that a *pruned fig tree never bears*, and that no figs can be obtained, unless the tree be suffered to run wild from the wall; nor can it be denied, that there is great truth in the saying, when applied to the most common method of

pruning these trees, i. e. by cutting away, or shortening, the last year's shoots, instead of cutting away old wood, and training those shoots to the wall, in its place: for when the tree is not pruned, all the bearing wood (i. e. the last year's midsummer shoots) is necessarily left untouched, but where the gardener shortens his shoots, he as necessarily cuts it all away. The rapid growth of the branches, however, will always set natural bounds to this system of leaving the tree wild; and there are, besides, two objections to it, which must be fatal, except in those favoured situations, where the fruit will ripen, in ordinary years, even on standards. *First,* that the midsummer shoots, wanting the immediate protection of the wall, will infallibly perish, in a severe winter; and whenever they die, in consequence of the action of frost, the mischief generally extends back to the spring wood of the preceding year, and not unfrequently to the branches. *Secondly,* that this species of fruit never ripens so early, or ultimately acquires so high a flavour, in this moist climate (where the absence of sun is severely felt, even in the most favoured situations), as when it is assisted, in shady weather, and cold nights, by the warmth arising from the immediate contact, still more than from the shelter of the wall.

Supplementary Note.

In all cases, where the spring shoots are particularly strong, it is adviseable to indulge the natural vigour of the tree, by suffering the greater part, if not the whole, of them, to grow to their full length, cutting out proportionable quantities of old branches, at the winter prunings. Should this propen-

sity to throw out very strong shoots, continue in succeeding years, more room must be given to the tree, or, if this cannot be done, the roots must be laid bare, and carefully raised, without tearing them.

XVIII. *Upon the Variations of the* Red Currant *(Ribes rubrum) when propagated by Seed. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read February 3, 1818.

The hardiness of the blossom of the *Red Currant* tree,* its abundant produce in almost every different soil and situation, the facility with which it is propagated, and the variety of uses to which its fruit is applicable, unite to place it amongst the most useful of our fruits; although the excess of its acid, and its want of sweetness, render it of little value in the dessert. It is, nevertheless, as a fruit, greatly superior to the sloe of our hedges, which I entertain no doubt of being able to prove the common parent of all our plums;

* Of what country the *Red Currant* is a native, I do not think we possess any decisive or satisfactory evidence. Mr. Aiton, in his Hortus Kewensis, supposes it to be a native of England; but this I think exceedingly questionable. It is generally found growing wild near the site of old villages, in different parts of England; but it does not appear sufficiently ubiquitous to have been a native, or to have been introduced at any very early period. The earliest description I have seen of it, is in Dodoen's History of Plants, the translator of which into English, in 1578, calls it "*the red beyondsea Gooseberie.*" He also states that the French, at that period, called the red beyondsea Gooseberies "*Groiselles d'outre Mer;*" and the Dutch, at the same period, applied the term "*over zee*" to it. These circumstances appear scarcely consistent with its being a native of the continent of Europe; and if it had been a native of England, it would scarcely have received its name from that given to the small seedless grape of the Levant.

and still more superior to the tough coriaceous husk of the common almond, which I have proved to be convertible into the soft melting flesh of the peach: and the state of the currant, in our gardens, at the present period, is probably little different, either in taste or flavour, from that in which it existed in its native woods. It can scarcely be doubted but that, like other species of fruits, it is capable of being rendered mild and sweet, by skilful culture, through successive generations; though, in the present state of infancy of the art of improving fruits, it is impossible to decide to what extent it may be improved. That it may become sufficiently saccharine to afford a vinous liquor, without the addition of sugar, appears at least possible, and, I conceive, not very improbable, if the Crab have been changed into the Golden Pippin, the Almond into the Peach and Nectarine, and the Sloe into the Green Gage Plum. The experiments necessary to decide the question, are easily made; and it is with hopes of exciting some Member of this Society, to engage in such experiments, that I, at the present period, address to them the following narrative.

Wishing to ascertain, to what extent the *Red Currant* could be made to sport in variety, by the means which I had adopted, to obtain seedling plants of other species of fruit, I procured cuttings, in the year 1810, of the finest varieties of the red and the white currant, that I was able to discover; which I planted in pots of very rich mould, and placed under a south wall, to which the trees were subsequently trained. At the end of three years, within which period the pots had been as often changed, the trees had become sufficiently large and old for my purpose, and were then first suffered to pro-

duce blossoms. These were, with the exception of a very small number, removed from the white currant trees, as soon as their buds unfolded; and those which remained were deprived of their stamens, whilst immature, and subsequently fertilized by the pollen of the red variety. The seeds, obtained from this experiment, were sowed in pots, as soon as the fruit had become perfectly mature, and were subjected, early in the following spring, to the artificial heat of a forcing-house; by which means, and by proper subsequent attention, the plant grew more than a foot in height, in the first season. At two years old, in the year 1816, several of the plants, and in the last summer, the greater part of them, produced fruit; which exhibited a much greater variety of character and merits, than I was at all prepared to expect. By far the greater number produced red fruit; but many of these, in ripening, first assumed a colour similar to that of the Dutch white, or rather yellow currant, and retained, when mature, a brighter tint, than that of the common red currant. The taste of almost all was more mild and sweet, than that of the red currant: some were rather insipid; and the sweetness of many was combined with an unpleasant medicinal flavour, somewhat similar to that of the black currant. In many there was a want of mucilage, and the juice, though sweet and well flavoured, separated too readily from the seeds, which consequently became more perceptible and troublesome; and, in one instance, in which the berries were greatly increased in size, the seeds were found to increase in size, proportionably still more than the berries. Five varieties, three red and two white, out of about two hundred, appeared

to me to possess considerably greater merits than either of their parents; and one of the red will, I believe, prove larger than any red currant now in cultivation. I sent specimens of two of the above mentioned varieties, a red and a white one, to Mr. SABINE, which were necessarily tasted, under many disadvantages: for innumerable swarms of insects had destroyed more than half the foliage of all the currant trees of my garden, long before the fruit ripened, and it ultimately ripened under almost incessant rain. I should, in consequence, have delayed sending this account to the Society, till I had obtained proper specimens of the fruit, to send at the same time, but that my trees have sustained so much injury from the insects, that I fear, few of them can produce fruit, before the year 1819; and it is much my wish, that the merits of those varieties should be tried in other soils, experience having taught me, that, in very many cases, the same variety of fruit will prove excellent in one kind of soil, and very worthless in another. The currants produced in my garden, owing, I conclude, to some peculiar qualities of the soil, are always more than ordinarily acid; and therefore the new varieties are more likely to become better, than worse, by change of situation.

Note by the Secretary.

The two varieties of currant, which the President sent to me in the last summer, and to which he has alluded in the preceding Paper, were, as he observes, tasted under peculiar disadvantages. On referring to the notes I made, at the time

I received the specimens, I find, that I thought they were both much sweeter than any currants I had ever tasted. This quality, alone, is of the greatest value, and therefore sufficient to recommend them for cultivation. The produce of future years will enable us to give a more particular account of other circumstances, in which they may happen to differ from the old currants of our gardens.

XIX. *Account of a Method of Grafting Oranges and Lemons, so as to produce Dwarf Fruit-bearing Trees. In a Letter to the Secretary. By Mr.* John Nairn, *Gardener to* John Cresswell, *Esq. F. L. S. &c.*

Read March 3, 1818.

Sir,

Having been successful in grafting *Oranges* and *Lemons*, with the fruit or flowers on the scion, a knowledge of the method which I have practised, may not be altogether unacceptable, or useless, to the Fellows of the Horticultural Society: I therefore send you the following description of it.

Let the operator select as many orange or lemon stocks as he wishes to work, and place them on a moderate hot-bed, for a fortnight, by which time the sap will have risen sufficiently to move the bark; the stocks must then be cut off, about two inches above the surface of the pot, and an incision made with a sharp knife, similar to what is done for budding, separating the bark from the wood on each side. Let the scion be cut thin, in a sloping direction, and thrust between the bark and wood, and then bound tight with woollen yarn; but very great care must be taken, in binding, to prevent the bark from slipping round the stock, which, without attention, it is very apt to do. After it is properly and neatly bound, put a little loam, or clay, close round the stock, to the surface of the pot, then, with a glass of the form subjoined,* cover the whole, and press it firmly into the mould, to prevent the

* See next page.

air or steam from getting to the plant; the glass must not be taken off, unless you find any of the leaves damping, and then only till this is remedied, when it must be immediately returned. The stocks must next be placed on a brisk hot-bed of dung, and in about six weeks, the glasses may be taken off, and the clay and binding removed; but it will be necessary to bind on a little damp moss, in lieu of the clay, and to keep the glasses on in the heat of the day, taking them off at night; when, in about three weeks or a month, they will be fit to be put into the green-house, where they will be found to be one of the greatest ornaments it can receive.

I should recommend the *Mandarine orange* for the first trial, as the fruit is more firmly fixed than that of any of the other sorts. I have, by the above method, had seven oranges on a plant, in a pot, commonly called a small sixty, which I conceive to be both curious and handsome.

It is particularly necessary to have the glasses in the form I have given, to prevent the damp from dropping on the scion.

I am, Sir, your very humble Servant,

JOHN NAIRN.

Battersea, February 21, 1818.

The Esperione Grape.

XX. *Some Account of the* Esperione Grape. *In a Letter to the Secretary. By* John Townsend Aiton, *Esq. F. H. S. of Windsor, Gardener to His Majesty.*

Read March 3, 1818.

Dear Sir,

By your desire, I send to you, with this letter, some cuttings of my *Esperione Grape Vine*, the fruit of which I had the honour to submit, through your kindness, to the Horticultural Society, last autumn; and it gave me great satisfaction to learn, that the Society had approved of the recommendation to cultivate this useful variety of grape. I shall, in consequence of your request, subjoin a few remarks.

I first noticed the Esperione grape about the year 1804, in the Catalogue of Mr. Richard Williams, the respected nurseryman at Turnham Green. Struck with the novelty of the name, I procured from him three healthy vines, which were planted, the same year, in his Majesty's gardens at Windsor, in a south aspect; and 800 square feet of wall were allotted for their culture. This space was completely covered in the fourth year, and, since that time, the plants, have always produced and matured large crops of fruit. Unfavourable as was the last season, they ripened about twelve hundred bunches of well coloured grapes. The *Esperione vine* is prolific to an extraordinary degree, very hardy, and of most luxuriant growth, perfecting its fruit equally well, and early, with the Sweet Water, and Muscadine; and in unfa-

vourable seasons, has a decided advantage over these varieties, and indeed, over any other hardy grape, that I am acquainted with.

The wood of this vine is strong, and high coloured; the buds are large, round, and very woolly. The fruit is produced on large bunches, handsomely shouldered, differing little, in size, from the Hamburgh. The berries vary much in form, being sometimes round, frequently flat-rotund, and indented on the head with the remains of the style. A groove, or channel, is often observed on one or both sides, decreasing from the head downwards. The skin, which is covered with a thick blue farina, is of a deep purple colour, inclining to black. The flesh adheres to the skin, and though neither high flavoured nor melting, is pleasant. The leaves are variously cut, and die upon the tree of an orange hue. I have no doubt that this is the same grape as TURNER's. LANGLEY has figured it in his *Pomona, plate* 45, but without giving a description.

These vines have been cultivated, here, in the manner recommended by MILLER, and other gardeners, for hardy grapes.

Believe me, dear Sir,

ever truly yours,

JOHN TOWNSEND AITON.

Royal Gardens, Windsor,
Feb. 20, 1818.

XXI. *On a Method of Retarding the Ripening of Grapes in Hot-houses, so as to obtain a Supply of Fruit in the Winter Season. In a Letter to the Secretary. By* Richard Arkwright, *Esq. F. H. S.*

Read February 3, 1818.

Sir,

In compliance with your wishes, I send you a short statement of the treatment of the vines, which produced the fruit you met with at Sir Joseph Banks's table, and of which you are pleased to speak so highly.

The house applied to the purpose of growing late grapes is, for about nine months in the year, used also as a succession house for pines, having a pit within it. The state of the house, at this time (January) is this: The pit is full of pine plants, and there are other exotics in it. The heat is generally about 60°. There are still about fifty bunches of grapes in a plump and perfect state. The sap is evidently flowing freely, as is evinced by the leaves, which are, on the latest kinds, as fresh and green as at midsummer. The sorts of vines cultivated in my house, for this late crop, are, the White Muscat of Alexandria, the Black Damascus, the Black Teneriffe, the St. Peter's, the Black Raisin, the Syrian, and the White Nice.

About the second week in February, the pine plants are always removed into another vinery. The grapes, which remain on the vines, are all cut, and the house thrown open,

for the free admission of air *at all times.* This opportunity is taken of washing the glass and wood, and of painting, if requisite; and also of whitewashing all the walls, flues, &c. with quick lime, so that, by one means or other, every kind of insect, as well as their eggs, is destroyed. About the latter end of April, or beginning of May, the vine buds begin to swell, when a gentle fire heat is applied, in the night, and in dark and cold days; but air is admitted freely, whenever the thermometer is up at 70°. At this period, a proportion of the pine plants is again brought into the house, where they remain till the succeeding February. The treatment, from this time, is quite in the common way, as practised by SPEECHLY, and most other gardeners, more care, perhaps, being taken not to apply too much heat, and to admit air as much as circumstances will allow. By this late and slow process, the grapes do not begin to ripen till towards the end of October, and the very late sorts, such as the St. Peter's, are scarcely ripe at Christmas.

I profess to have no general horticultural knowledge; but having given my attention to the culture of the vine, for many years, I will venture to suggest, what I conceive to be a material point to be attended to, by those who are desirous of producing late grapes, and that is, the exposure of the vines to the common atmosphere, *at all times*, between the periods I have mentioned, namely, the beginning of February, and the end of April, or early in May: for, by so doing, they become, and remain, torpid for a considerable time, and, I conceive, break almost at every eye more vigorously, and are kept in a healthy growing state,

with a *less* degree of heat, than when managed in the accustomed way.

It will be, of course, observed, that the warmth necessary for the pine plants, which are kept in my house, must, in some measure, counteract the process of retarding the ripening of the grapes, and that the principle, which I recommend, and on which I act, would be applied with more certainty, in a house which was solely used for the growth of late grapes.

I am, Sir,

Your obedient humble servant,

Richard Arkwright.

Willersley,
Jan. 19, 1818.

Note by the Secretary.

The specimens of grapes ripened in the manner described in the preceding paper, which were exhibited by Mr. Arkwright to the Society, on the 3d of February, were as rich, perfect, and fresh, as if they had been produced at the usual season: and the leaves, which were sent at the same time, were in a state of undiminished vegetation. These leaves, Mr. Arkwright has since informed us, were from the late sorts of vines, viz. the Syrian, the Nice, and the St. Peter's; those of more early kinds, such as the Muscat and the Damascus, begin to assume their yellow tinge about Christmas, but their fruit continues quite fresh and good for a considerable time afterwards. The conclusion is obvious, that the vines made to produce these late grapes, had acquired *the*

habit of late bearing, and this habit, Mr. Arkwright states, has been brought on gradually. Whenever he introduces a young vine into the house, where his late grapes are grown, it is treated exactly like the vines which are in bearing, and in the second or third year after planting, when it begins to yield fruit, it is found to have lost its disposition to break into leaf at the accustomed season. Mr. Arkwright began to practise his present plan of growing late grapes about twelve years ago, at which time he also used to force early grapes; and so successful was his plan of retardation, that, on the 1st of May, 1810, he had on his table, fresh gathered fruit, the produce of two years, viz. of the late crop of the past, and the early crop of the present year. He has now ceased to force any vines for early fruit, and confines his cultivation to that of late grapes alone.

XXII. *Some Account of the* Purple-fruited Passion Flower, *of late cultivated in England, and of the other known Species, which bear edible Fruit; with Observations on the* Passiflora incarnata *of* LINNÆUS, *and on the first Plant of the Genus, which was introduced into Europe. By* JOSEPH SABINE, *Esq. F.R.S. &c. Secretary.*

Read March 3, 1818.

IN the autumn of the two last years, the fruit of a Passion Flower, which was considered by many, who tasted it, as peculiarly agreeable, was exhibited at the meetings of the Horticultural Society. The plant bears abundantly in a stove, and as the management of it is not attended with any peculiar difficulty, it is very probable that, when it is more known, it will be more extensively cultivated; for which reason I have been induced to collect some particulars relating to its origin and treatment, and other matters connected with it, the details of which, I hope, will not be without interest.

This fruit, when first spoken of, was conjectured to be one of those usually called *Granadilla* in the West Indies; but this was a mistake, as will be evident, on a comparison of the description of the plants producing those fruits, with that which is the subject of the present inquiry.

Three distinct species of Passiflora yield edible fruit in abundance, in the West Indies: these are, the *P. quadran-*

gularis, P. maliformis, and *P. laurifolia,* all belonging to that division of the genus, comprehending those species, which have undivided leaves. They have all been, for many years, inmates of our stoves, where their beautiful flowers will always ensure them a place, in despite of that love of novelty, which too often rejects that which has considerable merit, solely because it is not new.

The *P. quadrangularis* is the most magnificent of those I have enumerated. It is called the *Granadilla* vine, and is much cultivated in the gardens of Jamaica, and the other islands. Its luxuriant perennial shoots are there formed into arbours, furnishing a thick shade, rendered more grateful by the beauty and odour of its flowers and fruit, which are both produced at the same time, on different parts of the branches. The fruit is very large, of an oblong shape, about six inches in diameter, from the stalk to the eye, and fifteen inches in circumference. It is greenish yellow, when ripe, soft and leathery to the touch, and quite smooth; the rind is very thick, and contains a succulent pulp, (which is the edible part,) mixed with the seeds, in a sort of sack, from which it is readily separated. Wine and sugar are commonly added to it, when used. The flavour is sweet, and slightly acid, and it is very grateful to the taste, and cooling, in a hot climate. The plant has occasionally borne fruit in this country, particularly in the gardens of Lord HAREWOOD, in Yorkshire. It is figured by Miss LAWRANCE, amongst her *Passifloras,* also by JACQUIN, in his *Icones pictæ selectarum stirpium Americanarum, tab.* 218, in which a very imperfect delineation of the fruit is given. The best representation, both of the plant and fruit, is in a large single

plate published by Mr. SOWERBY; it is also figured in the *Botanical Register, plate* 14. It is to the fruit of this species, that the name of *Granadilla* is more particularly applied.

The *P. maliformis* is also formed into arbours, in the gardens of the West Indies, and produces flowers scarcely inferior, in beauty and fragrance, to those of the preceding. Its fruit, however, is much smaller; it is nearly round, smooth, and about two inches in diameter, of a dingy yellow colour, when ripe; the coat is hard and strong, nearly a quarter of an inch in thickness, full of a very agreeable, sweet, gelatinous, pale yellow pulp, in which many oblong black seeds are lodged: this pulp is eaten in the same manner as that of the Granadilla, and is in much estimation. The plant is said to have borne fruit in the garden of the Bishop of DURHAM, at Mongewell, in Oxfordshire, as well as in Mr. VERE's garden, at Kensington Gore; but I apprehend, in both cases, very imperfectly. Good figures have been published of it, by Miss LAWRANCE, in her *Passifloras;* by ANDREWS, in his *Botanist's Repository, plate* 217; by JACQUIN, in his *Hortus Schoenbrunnensis, vol.* 2, *tab* 180, and in the *Botanical Register, plate* 94. It is called, in Jamaica, the *Sweet Calabash*, in reference to the coat of the fruit, which in its substance, resembles that of a bottle gourd. MILLER contends, that the name of *Granadilla* should belong exclusively to this, and not to the preceding species; it is probable, that it is indiscriminately given to both, in common usage.

The *P. laurifolia* grows wild in the woods of Jamaica, and is also cultivated there, and in the other islands. The flowers of this are, like the others, sweet-scented and handsome. The fruit is of the size of a hen's egg, but rather more

elongated, and tapering equally at both ends; when ripe, it is yellow, and dotted over with little white spots: it contains a whitish watery pulp, which is usually sucked through a small hole made in the rind; the rind is tough, soft, and thin; the juice has a peculiar aromatic flavour, is delicately acid, and allays thirst agreeably. I do not find, that it has ever borne fruit in the English gardens. Good figures of the plant are in Miss LAWRANCE's *Passifloras;* in JACQUIN's *Hortus Vindobonensis, vol.* 2, *tab.* 162, which is copied in JACQUIN's *Icones pictæ selectarum stirpium Americanarum, tab.* 219; in *Schneevooght's Icones, tab.* 38, and in the *Botanical Register, plate* 13. It is called by the French *Pomme de Liane;* by the English, *Water Lemon,* and *Honeysuckles,* though this latter name is given by BROWNE, in his History of Jamaica, to the fruit of the *P. maliformis.*

I now return to the history of the *Purple-fruiting Passiflora.* About eight years ago, EDMUND BOEHM, Esq., of Ottershaw, in Surrey, received from a Portuguese gentleman seeds of this plant, which was stated to be a native of South America, introduced some years since into Portugal, where it is trained, as a creeper, on the verandahs of the houses. By the obliging attention of JOHN JEFFERY, Esq., his Majesty's Consul General at Lisbon, I have received living specimens of the leaves and fruit from Portugal, where, he informs me, it grows in an open garden, trained to a wall. It may fairly be conjectured to have been brought to Lisbon from the Brazils, rather than from any other part of South America. One of the seedlings, raised at Mr. BOEHM's, was

given to Mr. Richardson, gardener to Lord Tankerville, at Walton on Thames, by whom, as well as at Ottershaw, the plants were so well treated, that they soon produced fruit abundantly. The seeds and cuttings, by either of which it is easily propagated, were soon distributed to various gardeners. John Aiton, Esq. of Windsor, received a plant from Mr. Richardson, three years since, which did well, and has fruited in the Royal gardens at Cumberland Lodge. John Simpson, Esq. of Fairlawn, near Seven Oaks, to whom the Society is indebted for the first specimens of the fruit, which were exhibited at its meetings, purchased a plant from Messrs. Colvill, in the King's Road, in May, 1814; and, under the impression that it was one of the West India Passifloras, put it into his stove, where it grew vigorously, and bore large quantities of fruit. My account of the cultivation of the plant is principally derived from the information which Mr. Simpson obligingly gave me, when I called at Fairlawn, in November last, to satisfy myself on the subject, by my own personal observation. To Mr. Richardson, and to Mr. John Aiton, I am also indebted, for information relative to the plant, and its treatment. The stem, after a year or two, grows thick and woody; the shoots are rounded, hollow, and green, bearing tendrils of a moderate length. The leaves are of a dark shining green, entirely devoid of pubescence, deeply divided into three lobes, of which the centre one is the largest, and, when the plant is strong, they are of considerable size; the petioles bear two small green glands, situated just below the origin of the leaf. The flowers cannot be reckoned particularly handsome; they come out of the axillæ of the leaves,

and are fragrant; the fringe is very conspicuous, consisting of filaments, or rays, which extend over the external parts of the flower; it is white, tinged with purple or violet, the dark colour predominating nearest the centre.

The fruit, when unripe, is green; but as it ripens, the colour changes to a dark, livid purple, and then very much resembles the fruit of the purple egg-plant. The general shape is elliptic, measuring about an inch and an half in diameter, and two inches from the stalk to the top; but is, in some cases, more globular. It is smooth, and very faintly marked with three longitudinal sutures, as if it were divisible into three parts; the outer coat is hard and tough, measuring nearly a quarter of an inch in thickness, the external half of which substance, when cut through, is purple, (green before it is ripe,) the other part being white, and this latter portion, which is like white leather, lines the whole interior of the coat. In the centre of the inside of each of the subdivisions of the coat, is a broad row of small processes, arising from the lining, and extending from top to bottom; to each process is suspended a small cyst, containing a bright yellow, or orange-coloured pulp, in which a single seed is imbedded. The seeds, in each fruit, are very numerous: they are flat, ovate, somewhat larger than common apple pips; when first excluded, they are smooth, but they soon become minutely speckled with dots, after exposure to the air. When the fruit is cut through horizontally, the contents seem to fill the whole space, and to be confusedly mixed together; but, by carefully making an incision down the line of the apparent sutures, and then separating the divisions of the coat, the internal arrangement becomes perceptible.

The pulp is not equally agreeable to all tastes; to many it is particularly pleasant: it is acid, and is thought by some to have a slight resemblance to the flavour of the orange; but I think, it is so peculiar, as not to be capable of description, by means of comparison. As the seeds do not readily separate, the whole contents of the fruit are usually eaten, either alone, or with wine and sugar. The pulp, made into a marmalade, is a most excellent and rich sweetmeat, retaining, in that state, its own particular flavour, and acidity. The fruit is improved by being kept for a few days, after it is gathered, on the shelf of the stove, until it begins to appear withered.

I have already stated, that this Passion Flower may be propagated both by seeds and cuttings. The leaves of the seedlings are at first entire, and not three-lobed; but in whatever way young plants are obtained, they very soon produce flowers and fruit, even in the first year. It is, however, advisable, to prevent the exhaustion which this early production may occasion, by thinning the fruit, until the plant is more advanced in strength. They will grow well in large pots, but the best method is, to plant them in an angle of the bark bed, which has been parted off, either by boards, or nine-inch brick-work, as low as the pit goes. At the bottom of the cavity, formed by this division, should be laid some brick rubbish, over which may be thrown a little dead tan, and the whole be then filled with equal parts of very old tan, and a compost of leaf mould and rotten dung. Herein the roots will strike freely, and will even spread through the partition into the pit, growing into the fresh tan. Such roots may be trimmed, and reduced, whenever the tan is changed: but should the plant have been some time in its station, it will be

as well to leave part of the old tan in the bottom of the pit, in which the protruded roots may remain undisturbed. They do not require the full heat of the pine stove, for they flourish best in a temperature of from 65 to 70 degrees; but they do not bring their fruit to perfection, if kept in a common green-house, or conservatory, though they will grow, and flower in it. The shoots, as they advance, must be trained near to, and under, the inclined glass of the stove: the first flowers will appear in May, and the blooming will continue until September, the fruit setting the whole time; but if it does not set well, it will be adviseable to impregnate the stigmas, by applying the pollen with a feather. As they grow, the very strong shoots should be cut out from their origin, for these do not bear fruit so abundantly, as those which are less vigorous; but the fruiting branches must not be shortened, on any account. The temperature must be kept up equally, during the time of flowering and fruiting; the crop will begin to come in, in August, and will continue until January: but the earlier produce is the best.

A single strong plant will, in one season, extend over 40 feet of glass, or more, if it be permitted to spread. Mr. Simpson's house measures 30 feet by 12, and his plant, though only three years old last summer, nearly covered the entire of the sloping glass; he reckoned that it had produced about 400 fruit, and I suppose, if the whole space were filled, that the crop to be expected in such an extent, might be at least 500. When the crop is all off, which will be early in January, the heat must be reduced to about 50°., so as to check, or stop the growth: this being effected, the shoots must be well cut in. As little old wood as possible, besides

the main stem, which rises from the pit to the glass, and a few pieces (about two or three feet of each) of the old branches, should be retained: for all that is to be trained under the glass to bear, in each year, ought to be the growth of the same season. It is found that the shoots break better, and in greater quantity, from the older wood than from that of two years standing. In this dormant and reduced state it is to be kept, during January and February, after which the necessary heat may be applied, to cause it to resume its functions, for the ensuing season.

It will be observed, that I have not given any name to this plant, except that of the ***Purple-fruited Passion Flower***; my opinion being, that, hitherto, it has not received a specific denomination. It is now called, in the nurseries, ***Passiflora incarnata***: but the ***P.*** *incarnata* of LINNÆUS is, without doubt, a perfectly distinct plant, though, in some points of character, resembling ours; which resemblance has induced the author of the ***Botanical Register***, who, at page 152 of his work, has published a figure, and some account of it, to describe it as a variety of ***P.*** *incarnata*, making that, which I consider as the true ***P.*** *incarnata* of LINNÆUS, the variety α, and the plant I am now treating of, the variety β. There are, however, circumstances and characters, which, in my estimation, ought to be considered as sufficient to separate them, and to justify any botanist, who may hereafter undertake the task, in describing the latter as a distinct species. To the eye of an ordinary observer, there is very little similarity between the two plants.

Before I notice the points of difference in the two plants alluded to, it will be necessary to give some account of that which I consider as the true ***P.*** *incarnata*. It is a native of

North America, growing on the banks of rivers, in Virginia and Carolina; it has a perennial root, which throws up, annually, a number of herbaceous shoots, extending, in a stove, to a considerable distance; it belongs to that division of the genus, which has three-lobed leaves; the flower is sweet-scented, and rather more showy than that of the other plant, the fringe being more tinged, and variegated, with purple. The fruit, when ripe, is pale orange-coloured, of the size of a middling apple, containing, like the other, many seeds, which are enclosed in a sweetish, pale yellow pulp; but this, though it is sometimes eaten, is not particularly palatable. The plant in America is called the *May Apple:* it is also denominated the *Maracoc* or *Maycock*, by some authors; but these are evidently corruptions of *Maracot*, the Peruvian name of the Passion Flower. MILLER made it bear fruit, by keeping it in a stove; but it has been usually treated as an out-door plant, and not being sufficiently hardy to bear the climate of England, has been lost in most of our gardens, and is now very scarce. It has been figured by Sir JAMES EDWARD SMITH, in the *first volume* of ABBOT'S *Insects of Georgia, plate* 12, and by Dr. BARTON of Pennsylvania, in his *Elements of Botany, plate* 25.

If we might rely on the authority of our old authors, this particular plant has long been known in the English gardens. PARKINSON, whose *Paradisus* was first published in 1629, describes it as cultivated at that time, growing about a yard and an half high, and bearing flowers (but not fruit), in July and August; he calls it the *Maracot sive Clematis Virginiana*, and mentions, that the roots came from Virginia. JOHNSON, in the Appendix to his edition of GERARDE'S *Herbal*,

printed in 1636, describes the *Maracoc* or *Passion Flower,* saying, that the plant, which the Spaniards in the West Indies call *Granadilla,* is the same which the Virginians call *Maracoc.* After giving a figure of the plant, which has the appearance of originality, he states, that it "grows wild in most of the hot countries of America, from whence it has been brought into our English gardens, where it grows very well, but flowers only in some few places, and in hot and seasonable years. It is in good plenty, growing with Mistress Tuggy, at Westminster, where I have some years seen it bear a great many flowers."

The differences between the plant I have now described, and the Purple-fruited Passion Flower, are, that the first is herbaceous, and the other shrubby, and these peculiarities are not affected by change of climate or situation: the leaves of the latter are perfectly smooth and shining, those of the former are somewhat hairy; the two glands, which in both are to be observed on the footstalks of the leaves, in the first are placed exactly on the point where the lateral nerves of the leaf are joined to the petiole, in the other, they are, though near, manifestly separated from this junction, and are also much larger; in the first, the germen is hairy, and in the latter it is smooth; and the colour of the fruit in one is yellow, and in the other purple. On these differences the specific character of the new plant will probably be formed.

Having confidently stated my opinion, that the Virginian plant is the true *Passiflora incarnata* of Linnæus, I now proceed to shew, on what grounds that opinion is founded. In 1753, Linnæus published his *Species Plantarum,* into which

his *P. incarnata* was introduced, having before noticed it in a dissertation in the *Amœnitates Academicæ,* written in 1745. He refers to Gronovius's *Flora Virginica,* where the specimen No. 151 of Clayton's *Herbarium* is described, which specimen is now in the possession of Sir Joseph Banks, and is the Virginian plant. It is not improbable, but that Linnæus himself saw this specimen, when he was at Leyden, with Gronovius, in 1737. The plant he describes was growing in the Upsal Garden, in 1745, and subsequent years, under his inspection, and the specimen in his own herbarium, which was most probably taken from that very plant, proves to be the Virginian Passiflora. If further confirmation of the fact were wanting, I might add the authority of my friend, Sir James Edward Smith, who has published the figure of the same plant, as the *P. incarnata,* in Abbot's *Insects of Georgia,* from a drawing made in America. Linnæus also refers his plant to that mentioned in the *Hortus Cliffortianus,* and which was growing previous to the year 1737, in Clifford's garden, at Haarlem, as appears by the *Viridarium Cliffortianum;* but as no specimen of it is in *Clifford's* herbarium, we have not the proof of the identity of that particular plant.

It is true, that Linnæus, relying on the accounts and description of certain old authors, has set down his plant for a native of Peru and the Brazils, as well as of Virginia: but from this notion I must dissent: and though, from want of positive evidence, I cannot disprove that opinion, I think I can sufficiently shew, that the authorities, on which it is built, are not decisive. Future investigation will settle this point; but in the mean time, I will give my view of the subject, pre-

viously observing, that it would be very singular, should it hereafter appear, that the same plant which grows in North America, high above the tropic, is also a native of regions immediately under the equinoctial line, without having intermediate *habitats*, to connect positions so remote. At present we have neither plants, nor specimens, from any American country, south of the tropic of Cancer, to shew such connection.

The supposed Peruvian *habitat* is given on the authority of MONARDUS, and others, who, about the end of the sixteenth century, described a fruit (of a species of Passiflora) found by the Spaniards, in the kingdom of Quito, called by the natives, *Maracot*, which, from certain internal and external resemblances to the Pomegranate, or *Granada*, they named the *Granadilla*, or *little Pomegranate*. Early in the seventeenth century, a plant existed in the gardens of Italy, which was supposed to be this Granadilla, and which was called by the devout Italians, *Fior del Passione*, or *Flos Passionis* (hence Passiflora,) because they imagined, that parts of the flower and leaf represented the instruments of the passion of our Saviour. Imperfect figures, and defective descriptions, of this plant were published early in and during the seventeenth century, from which nothing more can be ascertained, than that the Passiflora, which they possessed, had three-lobed leaves, and that it bore a yellow fruit. To the authors of these descriptions, which agree, as far as they go, with the Virginian plant, LINNÆUS refers his *P. incarnata*. The plant itself, unless it be the Virginian one, may have been long lost to the gardens of Europe. The above descriptions, as

well as the figures, agree with those of PARKINSON and JOHNSON, which I have before mentioned; and I have little doubt but that the plant of the old English authors, and of the cotemporary Italian writers, was the same. If this be so, and if our old gardeners are correct in stating Virginia to be the native country of their plant, then the Peruvian *habitat* must be abandoned; but I know their authority, on such points, cannot be relied on. In modern times, no plant has been found in, or brought from, Peru, which can be assimilated to the old *Fior del Passione* of the Italians; a discovery of this nature is wanting to clear up the question, which may, however, be somewhat elucidated, if a specimen of that plant should hereafter be found in any herbarium of the period, when it was in cultivation in Europe. With respect to the *Granadilla* of MONARDUS, I consider it useless to attempt to apply it to any one species: the Spaniards probably called the fruit of every Passion Flower they met with, by that name, and in their South American territories the native species of Passiflora are numerous.

The supposition that the *P. incarnata* is a native of the Brazils, is more easily disposed of, and must, I think, be altogether rejected. MARCGRAFF's account of the plants of the Brazils was published in 1648; he mentions four species of the "Granadilla of the Spaniards, *vulgò Flos Passionis,*" producing edible fruit: he calls them *Maracujas,* and describes, and gives a small figure of, each; but his descriptions and figures are very incomplete. His *Maracuja 3 maliformis,* with a three-lobed leaf, and a yellow fruit, was conjectured to be the plant which the Peruvian

and Italian authors had before treated of, and on such conjecture was quoted as a synonym, and authority for the *habitat* of LINNÆUS. Such a reference cannot surely be supported. If MARCGRAFF's herbarium exists, we might there discover what plant he meant; or, when the plant he actually saw, shall be found in the Brazils, it will perhaps so far agree with his description, as to satisfy us of its identity. We have recently become acquainted with two three-lobed leaved Passifloras, (beside the purple-fruited one,) which are natives of the Brazils; but their fruits have not yet been ascertained: one is growing in the collection at Kew, and a specimen of the other is in the Herbarium of my friend AYLMER BOURKE LAMBERT, Esq.; to one of these it is possible that MARCGRAFF's plant may be referable; but neither have any resemblance to the Virginian Passiflora, except that they have three-lobed leaves.

I have been induced to enter thus into a detail of this matter, not only as the question is in itself one of some curiosity, but because I conceive, that the attempt to settle such a doubtful point must be matter of extraordinary interest to every gardener. I scarcely know a plant, to which so much peculiarity attaches, as the original *Flos Passionis*, whether we consider the singular properties attributed to it by the Jesuits, or that it was the first, and, for more than a century, the only species cultivated, of perhaps the most beautiful genus of plants existing; or that, though so much prized, two hundred years ago, in the gardens of Europe, all knowledge of, and certainty respecting it, should since have been lost, though I hope the present enquiry will lead to its discovery.

The points, to be determined by future investigation, are: 1st. Whether the *Flos Passionis* of the Italians is the Virginian plant (that is, the *P. incarnata* of Linnæus,) or not. 2d. If it is, whether it is a native of any other country, than those parts of North America, where that plant is known to grow. And 3d. If it is not the *P. incarnata* of Linnæus, to what species of Passiflora it must be referred, or whether it is still undescribed by modern authors.

XXIII. *Notices of Subjects communicated to the Horticultural Society, between May 1st, 1817, and April 1st, 1818, of which Separate Accounts have not been published in its Transactions. Extracted from the Minute Books and Papers of the Society.*

May 20, 1817. Mr. Oldaker sent from Sir Joseph Banks's Garden, at Spring Grove, a new variety of *Radish*, imported by him from Russia in 1812. The root is white, tapering like a carrot, and is much larger than is found in any of the common Radishes; it has rather a nutty flavour, approaching to that of the Rampion. The cultivation of it is the same as that of other Radishes. By successive sowings, in a rich and moist soil, it may be obtained for use, during the whole summer. It does not run to seed so rapidly as the common sorts.

July 15, 1817. Mr. John Wilmot, of Isleworth, sent some specimens of a *Strawberry*, very superior both in size and flavour, the produce of a *seedling*, raised by himself. It is valuable on account of being very prolific, but more particularly, by ripening later than the common Scarlet, to which it has some affinity. The plants of the Scarlet Strawberry, in an adjoining bed, had been cleared of fruit ten days, before these specimens were gathered. It is called Wilmot's late Scarlet Strawberry.

September 2, 1817. A *Melon*, raised by Solomon Israel,

Esq. of Stamford Hill, was tasted. The seed was received by him from Spain: it has been called the *Valentia Melon,* but, as it is produced equally in all the other countries bordering on the Mediterranean sea, this name seems to be erroneously applied. The proper appellation is the *Winter Melon;* its chief merit consisting in the property it possesses of keeping in store a considerable time after it has been gathered. If suspended, when ripe, in an airy and dry room, it will remain good till January, and even later, and thus supply the dessert with an article of some utility at that season. Other specimens were exhibited at subsequent meetings. During the winter, some of the fruit was imported from Spain to the London market, by which circumstance its keeping property is fully proved. It is grown on a hot-bed, exactly in the manner of common Melons. The skin is thin; the flesh white, becoming of a pale straw colour as it ripens; it is firm, saccharine, and juicy, and though not rich, is pleasant. The shape of the fruit is oval, with pointed extremities; the colour dark green, minutely dotted with very light green; it is very slightly ribbed, and has sometimes, on part of the coat, a few brown glandular processes, like the reticulations of netted Melons. The imported fruit, from being gathered unripe, has rarely much merit; it is occasionally yellow, and sometimes white. The accompanying figure of the fruit represents it about one-third less than its usual size.

OCTORER 7, 1817. A *Melon,* raised by Mr. ISRAEL, from seeds sent to the Society from Sir GORE OUSELEY, through Sir JOSEPH BANKS, and distributed to the Members at the Meeting of the 21st January last, was exhibited. It is called

The Winter Melon

the *Sweet Melon of Ispahan;* in shape it is ovate, and varies in length from eight to twelve inches; it is nearly quite smooth, of a deep sulphur colour, and has a peculiarly delicate appearance. The skin is very thin, and the flesh white, extending about half way to the centre; it is crisp, sugary, and rich in taste.

At the same Meeting, were exhibited, several specimens of *Grapes,* of great merit, grown by John Williams, Esq. of Pitmaston, near Worcester, in his garden. Amongst them was the *Red Hamburgh Grape;* this is often confounded with the Black Hamburgh; both, according to Miller, were introduced about a century ago by Mr. Warner of Rotherhithe, and the first is sometimes called *Warner's Hamburgh Grape.* They have a great resemblance to each other, but are distinct varieties. The berries of the Black Hamburgh are more oval, the flesh is firmer, and the skin thicker, and of a deeper purple. The foliage, wood, and buds of the two sorts have so near a resemblance, that the difference is only to be distinguished when the leaf changes colour in the autumn, at which season that of the Black Hamburgh becomes mottled with yellow, without any purple or reddish streaks: whereas the Red Hamburgh commonly variegates with a mixture of purple, green, and yellow. The Red Hamburgh Grape is considered to be the richest and best flavoured fruit, to most palates, especially if the plant is not over cropped. These Grapes never become of a black colour, if too many bunches are suffered to remain on the shoots; the berries then are of a reddish colour, the lower part of the bunch withers, and the fruit is without flavour. As a general rule, *one bunch* only should be left, on each annual shoot. The Red Hamburgh is a hardy variety, requires little skill, on the part of the

Gardener, to bring it to perfection, and as the berries hang loose on the bunch, it does not require so much thinning, as many other kinds.

At this Meeting, a *Queen Pine* of great beauty, and superior flavour, was received from Mr. THOMAS BALDWIN, Gardener to the Marquis of HERTFORD, at Ragley. It measured sixteen inches in circumference, seven inches in length, and weighed four pounds. The size and excellence of this fruit were remarkable, when it is considered that the plant on which it was produced was little more than fifteen months old. The method of thus expeditiously bringing the fruit to perfection is applicable only to the Queen Pine: Mr. BALDWIN keeps the suckers in tan, under a frame, without fire, until they are well rooted, when they are removed into the fruiting house, and bear freely in the second season. The sucker which produced the above fruit, was taken off in the beginning of July 1816; it was put into a small pot of about six inches diameter, and plunged into tan, as above described; it continued therein till the end of September following, when it was shifted into a pot of nine inches diameter, and removed to the fruiting house, where it fruited at the end of the succeeding September.

At this Meeting also, Specimens of the *D'Auch* and *Colmar Pears* were shewn, sent together from the Royal Gardens at Kew, to illustrate the difference of the two sorts. They have been supposed to be the same fruit, and (since the French writers do not mention the D'Auch Pear) this opinion has been very prevalent; but the difference is sufficiently manifest. The D'Auch Pear ripens a fortnight later than the other; it is more highly flavoured, and has yellowish flesh, the Colmar being internally of a greenish white. In the D'Auch Pears

exhibited, the end next the stalk was thick and flat, whilst that of the Colmars was pointed ; but this external character is not constant, the two kinds varying much in shape, and consequently in appearance, often resemble each other.

December 2nd, 1817. At this Meeting, reports were read, on the merits of different packages of *Pears*, sent to the Society, by Dr. Van Mons, from his garden at Brussells. The fruits transmitted by this obliging correspondent of the Society too often arrive in a very unfavourable state, from defective packing, and with the disadvantage of being only single specimens, to submit to examination ; some are without any mark, others only designated by numbers, and but few with names. If these circumstances had not created difficulties in the introduction of the sorts to this country, we should, ere this, have been in possession of many most valuable kinds, certainly far superior to any Pears now existing in our gardens. Many sorts of extraordinary merit must still remain unnoticed, for the reasons above given, but it is hoped that the character and description of the following kinds, to which names have been attached by Dr. Van Mons, may prove correct. 1st, *Knight*, ripe early in October ; not a large fruit, truncated, widest at the head, green, very good, in flavour not unlike a fine Swan's-Egg. 2nd, *Dillen*, ripe early in October ; three inches and a half long, by near three inches wide, ovate, irregularly turbinate ; eye flat, stalk short and thick ; colour, a yellowish green, slightly speckled with brown ; flesh white, with a slight musky flavour, and very little core : a fine Beurrée Pear of the first order, and very handsome. 3rd, *Calabasse d'Evêque*,

pyramidal shaped, three inches and a quarter long by two inches wide; colour citron, with red and russet brown; flesh melting and vinous: very good. 4th, *Charles d'Autriche*, received before;* in colour something like a White Beurrée, but in shape more convex and irregular: the drawing of this fruit, sent to the Society by Dr. Van Mons, represents it of a more golden hue: a very good fruit, but inferior to the specimen sent last year. 5th, *Marie Louise*,* ripe in the middle of October; long ovate, three inches and a quarter long, by two inches and a half wide; greenish yellow, with a large portion of russet in splotches over it, but not red; flesh white, highly vinous, and rich: a most excellent fruit, but this specimen was more like a fine St. Germain than a Bon Chretien, as stated in the passage referred to below.

At the same Meeting, some *Achan Pears* were tasted, sent by Sir George Mackenzie from Edinburgh. They are but little known in the south, though much grown in Scotland, where they are highly esteemed; in flavour they are nearest our Swan's Egg Pear, but are more tapering in their figure, and the coat is browner and coarser, though this is probably the effect of a more northern climate. It is understood that there exists more than one variety of this Pear.

At this Meeting, a *large Apple*, raised in the garden of Mr. Smith, near the city of Baltimore, in America, was exhibited. It had been recently imported, with others, into Liverpool, by Captain George Hobson, of the Belvidera of Baltimore, who sent it to Sir Joseph Banks, by whom it was presented to the Society. This apple, of which an engraving

* See vol. ii. page 406.

The Baltimore Apple.

accompanies this account, weighed one pound seven ounces and a half; it measured, in circumference, one foot two inches and three quarters; and in height, as it stood, it was four inches. It proved very good, though it was over ripe; it was very close at the core; and if a good bearer, will deserve general cultivation.

At the same Meeting, Mr. George Anstice of Stockland, near Honiton, communicated a *plan for heating Hothouses* on an economical principle, two houses being heated by one fire, in the following manner; a common cast iron stove is inclosed in an outer case, large enough to leave a space of a few inches all round; one iron pipe proceeds from the back of the stove into the flue of the house which is to be heated, and thus the smoke acts as in a common flue. Another pipe is inserted into the outer case, without having any communication with the stove in which the fire is; and this carries off the heated air, which is continually formed between the stove and the case, and, by means of vents at intervals in the pipe, discharges it into a second house: the vents may be opened or stopt at pleasure, and thus the degree of heat may be regulated. This plan does not, of course, increase the positive quantity of heat, but applies that to advantage which would otherwise be uselessly spent, in heating whatever might come in contact with the sides of the stove.

December 16th, 1817. Some *Borsdorf Apples*, imported by Sir Joseph Banks, from Germany, were sent by him to the Meeting this day. They seem different from the fruit with the same name, received by the Society from the

Royal Garden at Kew, but are undoubtedly the true kind. They are about as large as a full sized Golden Pippin, very regularly shaped, with a full open eye, having a yellow coat and a very brilliant patch of red on one side, with a pleasant sweet flavour. They are very good dessert apples, and are particularly esteemed in Germany.

January 6th, 1818. Mr. Thomas Ashworth, Gardener to the Marquis of Bath, sent from Longleat to the Meeting, this day, some *young Potatoes.* The following is the method practised by Mr. Ashworth, to obtain them. In the beginning of April, a quantity of large Potatoes are selected, and laid up in a dry airy room; they are turned over four or five times during the summer, and all shoots which they make are taken off as they appear. These are used for the seed, and are planted in succession from the beginning of September to the end of December, in boxes, in the following manner. In the bottom of each box, a layer of light vegetable mould, four inches deep, is placed, on which the Potatoes are laid, two inches apart, and these are covered with another layer of the same mould, and of the same depth. On the surface of the second layer, Potatoes are again laid, and then covered as before; this is repeated until the box is full. The boxes may be kept in any of the fire houses, or in a warm back shed, and in three months from the time of planting, young Potatoes fit for use will be formed. It is to be observed, that the young Potatoes thus obtained, are much inferior in quality to those produced by vegetating plants; but as it is scarcely possible to bring forward Potatoes in beds so soon, this plan is

useful, when considered as a means of obtaining a luxury at so early a season.

JANUARY 20th, 1818. Mr. THOMAS MOFFAT, Gardener to the Viscount SIDNEY, at Frognal in Kent, exhibited some *early Potatoes,* grown in a way different from that first described. It is as follows: a compost consisting of equal quantities of loam, sand, and coal ashes, with an addition of lime in powder, equal to about one fifth of the whole, was formed into a bed, four feet wide and four inches deep, on the floor of a dark fruit room. Upon this bed, early in September, large Potatoes of the preceding year's growth, were laid, three inches apart every way, with their best eyes downwards: these produced young Potatoes, which became fit for use about Christmas.

MARCH 17th, 1818. Mr. CHARLES BENHAM, of Isleworth, brought several varieties of ripe *Oranges* of his own growth, one of which, on account of its novelty, as well as beauty and excellence, attracted particular notice. It was a *Blood Red Orange,* of an elongated, almost cylindrical shape; the juice and flesh were of a deep purple colour, sweet and rich, and the skin possessed a superior agreeable flavour.

XXIV. *Account of an Experiment made to ascertain the relative Produce of the* Red Apple Potatoe, *when cultivated in single or double Drills, or in Beds. By Mr.* James Drummond, *of the Botanic Garden, Cork, Corresponding Member of the Horticultural Society.*

Read April 7th, 1818.

The *Red Apple-Potatoe* is so much superior to all others, which I am acquainted with, for winter and spring use, that any improvement in its mode of cultivation is deserving of notice. As a proof of its good keeping qualities I need only mention that, in the month of July last, when *new* Potatoes were plentiful in Cork markets at 1*s*. and 1*s*. 2*d*. per *weight*,* the *old* Red Apple-Potatoes went readily off at 1*s*. 4*d*. and 1*s*. 6*d*. per *weight*. The best time for planting this particular sort is about the end of April, but they are often planted as late as the beginning of June.

The usual mode of cultivating Potatoes in Ireland, is in beds, for it is thought that less labour is required in that method than in the drill culture. I have found, however, that even when all the work is done by the spade, there is very little difference; but to farmers who can use the plough, the drill is certainly more advantageous in the saving of labour. Experience has taught us, that the beds are most productive, and this has been ascertained by the following,

* The *weight* is equal to 21lbs.

as well as former experiments, instituted and conducted by myself; but as the ground after the drills, is in so much better order for any succeeding crop, I thought it a matter of some importance, to find out a method of making the drill as productive as the bed culture; at the same time preserving the superior advantage of cleaning and ameliorating the soil. With this view, I laid out a plot of ground in the Botanic Garden, 63 feet wide by 56 feet long; and divided it, lengthways, into three equal parts, for the purpose of the experiment. The third part of the whole, formed exactly three beds, five feet wide, with alleys of two feet between them. These were treated in the following manner, which is that practised by the market gardeners, in the neighbourhood of Cork: the sets were planted about nine inches asunder in the beds, and not deep; the manure was afterwards spread on the whole surface of the bed, and covered with earth dug from the alleys. When the plants made their appearance, they were earthed a second time, and, as they advanced, a third time, where the depth of earth between the beds allowed of it. This is all the care requisite, until they are fit to dig.

The other two parts of the plot of ground, were planted in drills, one part having ten single drills, two feet asunder, and were treated in the usual manner. The other part having eight double drills, that is, a drill on each side of a line, so as to have two rows, composing a double drill, about six inches asunder: the treatment of the two sorts of drills, was precisely the same. The quantity and quality of manure was the same in each of the three experiments, but the number of plants was different in each. The following

statement will show the number of sets, and the relative produce of each, in marketable and small Potatoes.

Number of sets.		Produce of marketable Potatoes.	Produce of small Potatoes.
In the Beds, ...	1380 . . .	26 weights or 546lb.. . . .	$3\frac{1}{4}$ weights or $68\frac{1}{4}$lb.
In the single Drills,	810 . . .	$23\frac{1}{2}$ weights or $493\frac{1}{2}$lb. . . .	2 weights or 42lbs.
In the double Drills,	1360 . . .	27 weights or 567lb. . . .	$3\frac{1}{4}$ weights or $68\frac{1}{4}$lbs.

XXV. *On the Cultivation of the* Balsam. *By the Rev.* William Williamson, *Corresponding Member of the Horricultural Society.*

Read April 7th, 1818.

Having found, by repeated experience, that the methods generally used in the cultivation of the *Balsam*, (*Impatiens Balsamina* of Linnæus), are far from being successful, I am induced to send, for the consideration of the Horticultural Society, the following account of a method, by which I have raised this beautiful annual, to a degree of perfection, which has exceeded my utmost expectation.

It is, I believe, generally understood, that the small fibres of the root, are the principal organs through which nourishment is conveyed to plants of every description, and every one, who has raised this plant, must have observed the numerous fibres of which the root is composed. It was this circumstance, which led me to adopt the following mode, by which nourishment is afforded, in proportion to the number of organs destined to receive it.

Having procured a quantity of rich mould (that composed of three parts vegetable earth, and one part common soil of the kitchen garden, I have found to answer best), I expose it to the sun and air during the summer: in October it should be placed under cover, to prevent its being saturated by the autumnal or winter rains, Previous to its being

used, it must be sifted, to render it as light as possible. In the latter end of February, or the beginning of March, I sow the seeds in a pot of this earth, which may be placed in any frame that is at work, but artificial heat is absolutely necessary. The frame is kept close, that the young plants may be drawn up rather tall. As soon as they have got four leaves, I transplant them singly into the smallest pots I can procure, and in such a manner, that the stem of the plant may be covered somewhat more than it was at first, and then all are to be again placed in the frame. In a very short time, if there be a sufficiency of heat, that part of the stem, which is covered with the mould, puts forth fibres, by which nourishment is conveyed more immediately to the principal stem of the plant. As soon as the plants are a little advanced in growth, they are again removed, (if possible without disturbing the earth,) into somewhat larger pots; still planting them rather deeper than before. The same process is repeated five or six times, till, at last, they are removed into their final pots. I have found it best to give them their last removal after they have opened their first blossoms, as it gives additional brilliancy and size to the flowers. By following this method, the plant acquires extraordinary vigour, throwing out its branches from the surface of the mould, exhibiting flowers nearly as large as a full blown rose, and a stem, measuring two and sometimes three inches in circumference.

I believe the common practice is, to plant them directly from the seed vessel into a pot of large dimensions, by which means the fibres, after a short time, come into contact with the sides of the pot, form a matted coat of roots round the

earth, and soon cease to receive sufficient nourishment from it; the plant, therefore, languishes, and seldom arrives at any great degree of perfection: but, by the method here described, not only a continual succession of nourishment is afforded, but fresh fibres are continually emitted, by which that nourishment is received.

Another considerable advantage, arising from planting them in small pots* at first is, that they feel the beneficial influence of the heat of the bed much more, than when planted in those of a larger size, and that too, at a time when the stimulus is most wanted.

As the plants, during the time of their growth, require a considerable quantity of water, it might, perhaps, increase their size, if the water were saturated with manure, as recommended by Mr. Knight, in a former paper of the *Transactions.*†

* I cannot help suggesting to the lovers of flowers, the expediency of using small pots at first, in all cases, where a supply of heat and an increase of foliage are desired, continually moving them into larger as they advance in growth; principally for the reasons given above, and also from this important consideration, that those who are pressed for room will thereby be enabled to nourish more plants, than if the larger pots were used at first.

† See vol. ii. page 127.

XXVI. *Account of a newly-constructed* Frame, *with rising Lights, for growing* Melons, Cucumbers, *&c. In a Letter to the* Secretary. *By Mr.* John Nairn, *Gardener to* John Cresswell, *Esq. F. L. S. &c.*

Read April 7th, 1818.

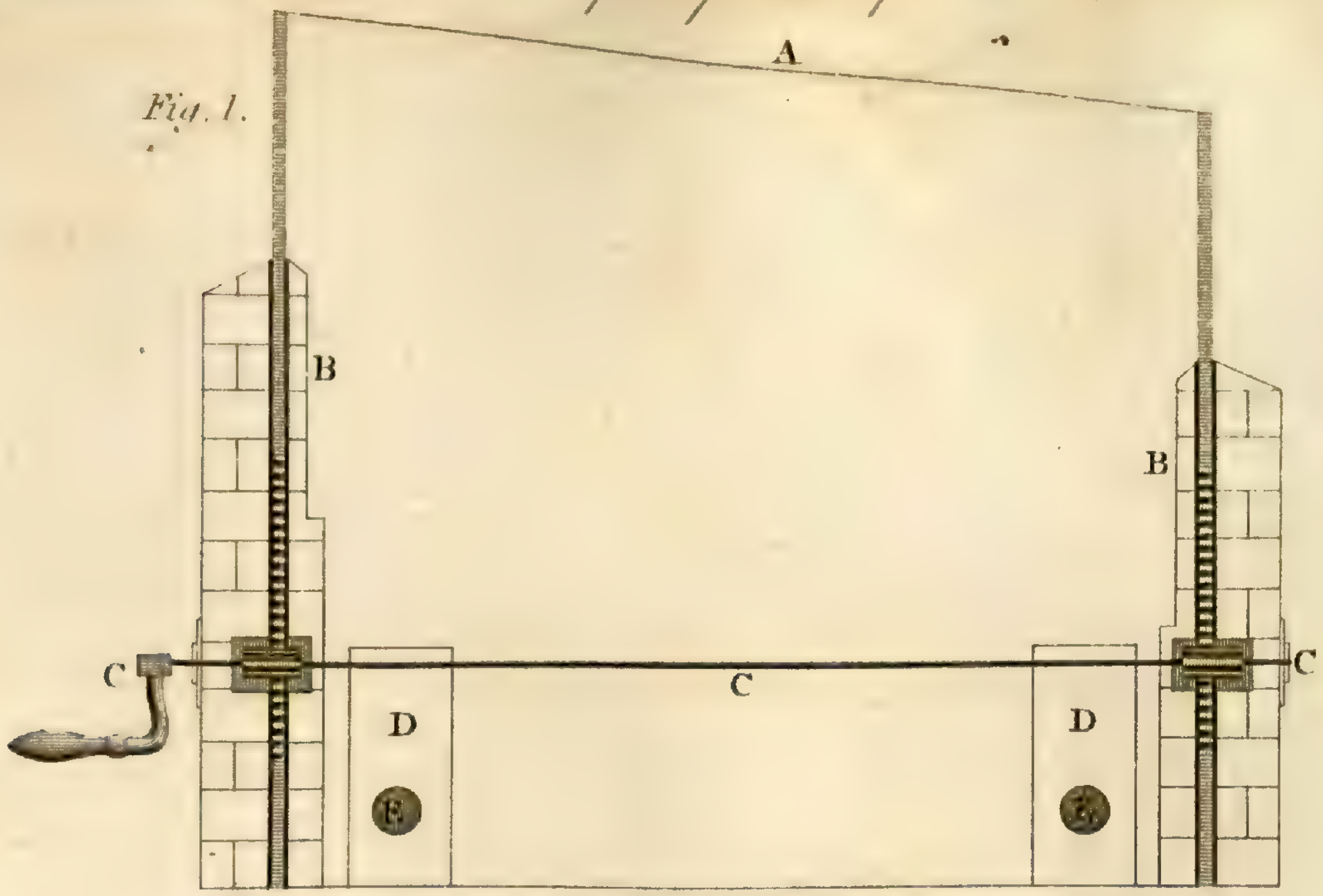
Sir,

I herewith send you, for the inspection of the Horticultural Society, a model, with a plan, of what I conceive to be an improved *Frame* or *Pit* for growing Melons, Cucumbers, &c. Cultivators have always great difficulty in raising their Frames, and their plants often suffer from being at too great a distance from the glass, which is known to be very injurious; to obviate these inconveniences, I have constructed this Pit, that Gardeners may raise or lower the glass, as they thing proper, without the least danger, and with little trouble.

This Pit will also be found of the greatest utility in forcing flowers of every description; as, whatever may be their height, they may at all times be kept close to the glass, by gradually raising the lights, as the plants grow; by which means the possibility of their being drawn will be prevented; it will also be found well adapted to the growing of Balsams, Tricolors, Cockscombs, or any other tender annuals, which require a quantity of head-room; they will not require to be moved, as is now the practice, frequently with

Section of the pit and frame.

Fig. 1.



Frame with rising lights, constructed by Mr. John Nairn.

REFERENCES.

Fig. 1.

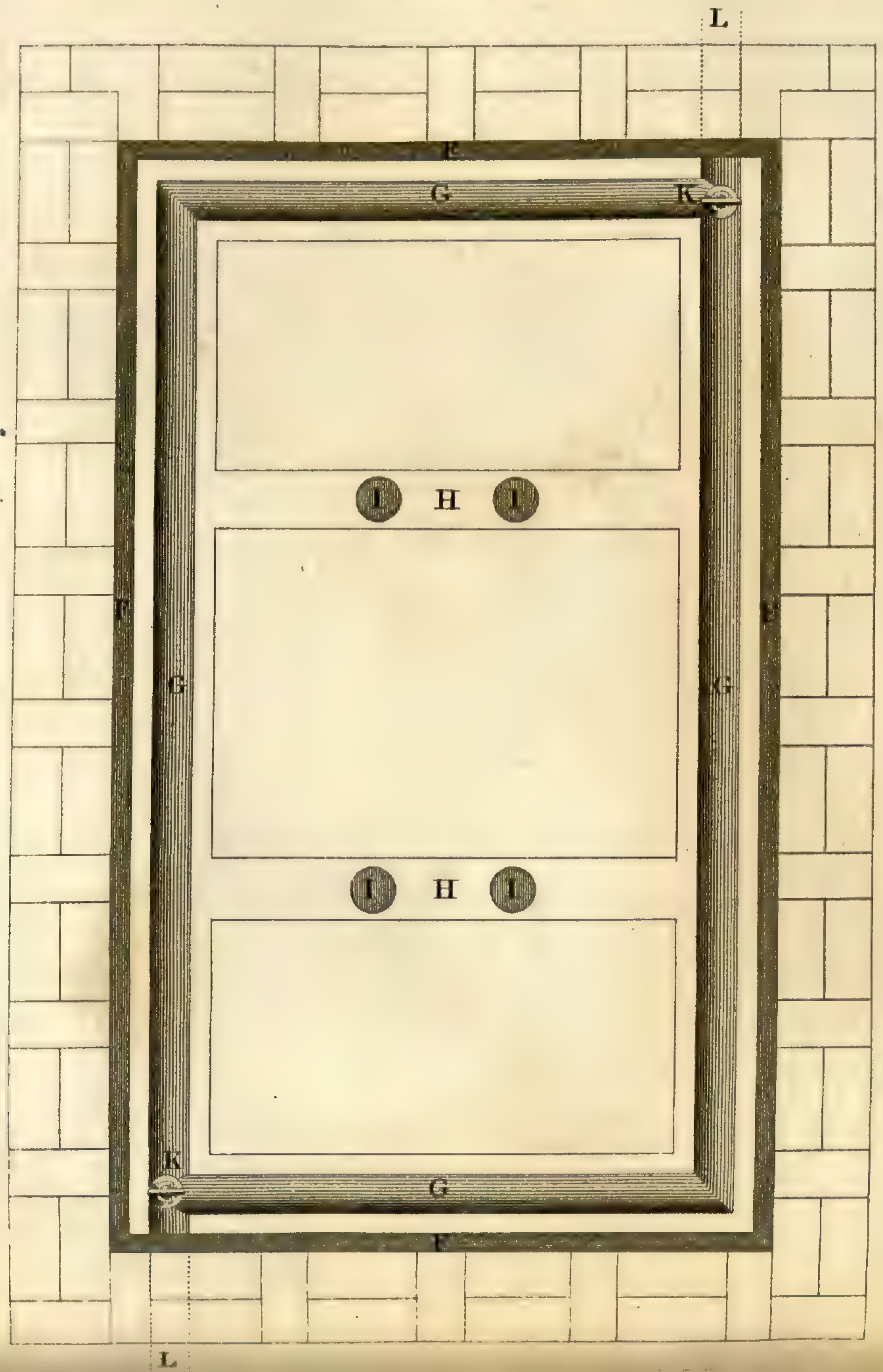
A. *Moveable Frame at its height.*
B. *Inside lining of the Pit.*
C. *Backs and Spindles for raising the Frame.*
D. *Flues containing hot Air.*
E. *Steam Pipes.*

Fig. 3.

F. *Cavity between the Flue and outer wall.*
G. *Steam Pipes.*
H. *Two flues for the reception of hot air, and also to protect the spindles.*
I. *Openings for the admission of hot Air.*
K. *Stop cocks, by means of which one or more pits may be heated at pleasure.*
L. *Continuation of the Steam Pipes.*

Ground Plan of the Pit

Fig. 3.



Perspective representation of the pit and frame.

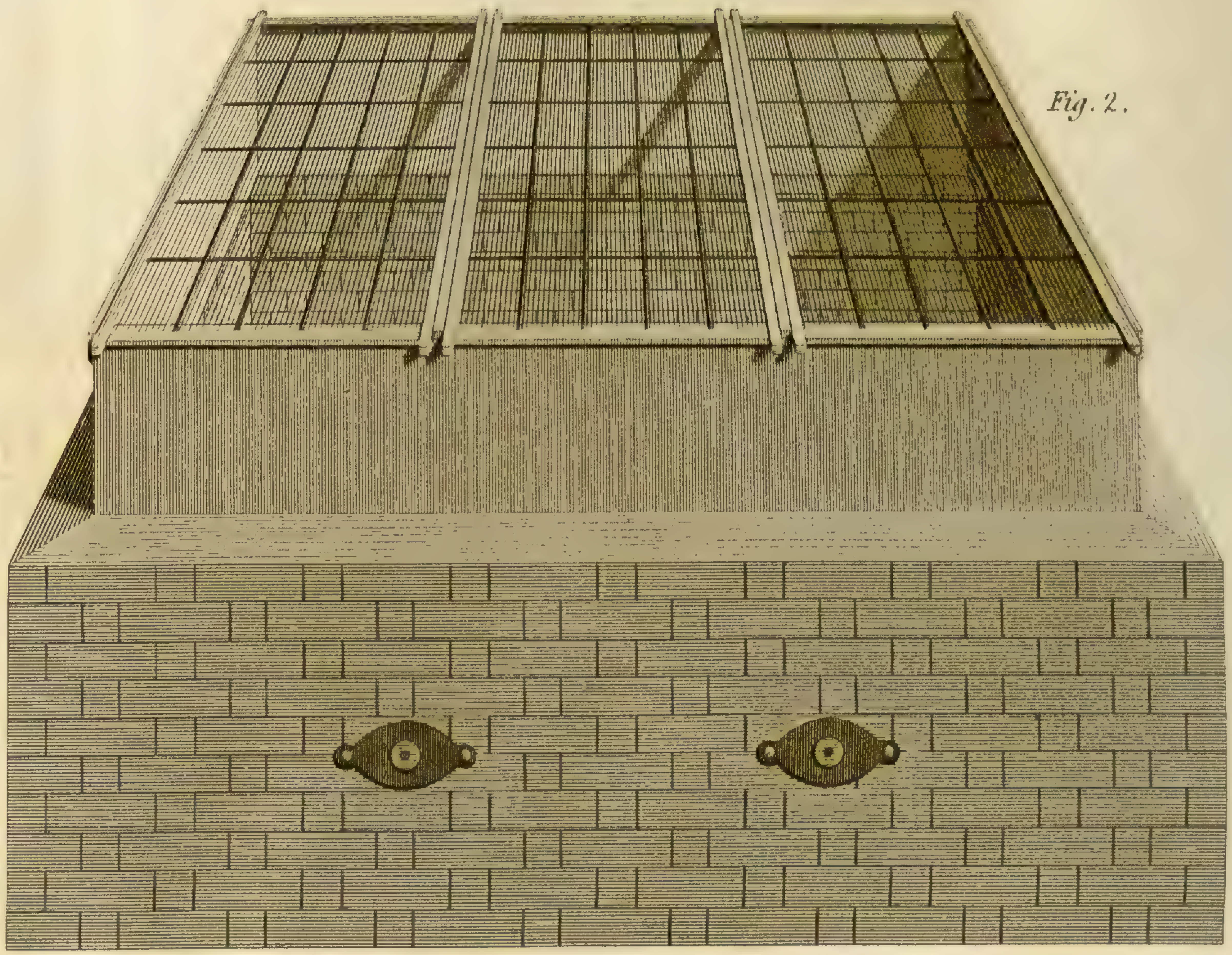
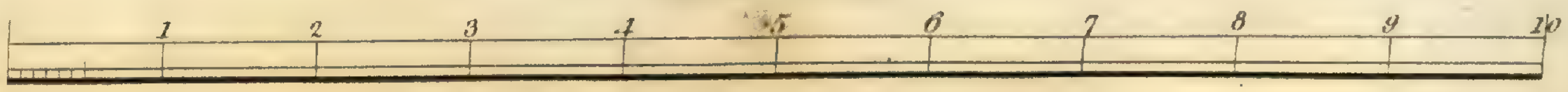


Fig. 2.

Scale of Feet.



unavoidable injury to the plants, and a great sacrifice of time, both of which disadvantages will be obviated; for the plants may remain untouched in my Frame, and one or two men may raise the glasses of thirty lights in a few minutes; whereas, to remove the plants contained under half that number, would take the same labourers a whole day; and the risk of exposing the plants to a chilling atmosphere for many hours, during the operation of removal, will be done away entirely.

It will be found equally advantageous in the protection of Heaths, through the winter. It is well known that the nearer the plants are to the glass, the greater is the danger from frost, and if they are far from the glass, they are liable to suffer from damp, and from drawing: this improvement prevents all these injuries, for, by raising the lights at night, the plants will be kept at as great a distance from the frost as can be wished, and by lowering them in the morning, the glass will be brought so near to the plants, that they will neither be drawn, nor hurt by damp.

In growing Cucumbers or Melons, on dung or tan, put into pits of the usual construction, the greatest inconvenience always results from the settling of the dung or tan, the plants being thus carried too far from the glass; by the method now proposed, if the pit is filled high in the first instance, the glasses will always have sufficient room to follow the settling.

I am so well satisfied of the advantages of the steaming process in the growth of Cucumbers and Melons, that I should consider my plan imperfect without its application; I have therefore formed it so, that steam pipes may be

introduced wherever an apparatus for that purpose has been fitted up, and it will be seen that either one or more pits, as may be desired, can be worked at one time with the steam.

I am, Sir,

Your very humble servant,

JOHN NAIRN.

Postscript.

A Frame intended to answer some of the same purposes as the one I have described, was, a few years ago, constructed by Mr. EDWARD WEEKS, of the King's Road, Chelsea; it is therefore incumbent upon me to state, in what essential particulars mine differs from his. To the inside of Mr. WEEKS's Frame was fitted a wooden box, about nine inches deep, to contain the mould, and plants, which was suspended over the dung: this, by means of a rack and pinion, was to be elevated and depressed, as occasion required, the lights remaining stationary. The inconvenience of such a plan must be obvious, when we consider the weight of the material to be moved, to say nothing of the impossibility of applying any other mode of heating than that of dung. In my Frame, the dung, mould, and plants, are placed in the usual way, and the lights are the only parts moved. Mr. WEEKS's plan was applicable to a Frame with dung heat only, mine answers equally well for a Pit, and therefore, may be used with tan, steam, or fire heat, as well as with dung.

XXVII. *Upon the Propagation of Varieties of the* Walnut Tree, *by budding. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read April 7th, 1818.

The ill success of many attempts to *propagate* the *Walnut Tree* by grafts, or buds, led me, in a former communication, to discourage all attempts to increase it, except by seeds, or by grafting by approach. I nevertheless continued, annually, to make a few experiments, with the hope of discovering a method of budding, which would prove successful in the culture of varieties of this fruit, and of others of equally difficult propagation; and I have found, in ultimate success, the usual reward of patient perseverance.

The advantages of propagating varieties of the Walnut-Tree, by budding, will, I think, be found considerable, provided the buds be taken from young, or even middle aged healthy trees: for, exclusive of the advantage of obtaining fruit from very young trees, the planter will be enabled to select not only such varieties as afford the best fruit, but also such as endure best, as timber trees, the vicissitudes of our climate. In this respect some degree of difference is almost always observable in the constitution of each individual seedling tree; and this is invariably transferred with the graft or bud.

The Walnut, it is true, as a fruit, contains but little nutri-

ment, and perhaps constitutes, at best, only an unwholesome luxury: but the tree affords timber of much greater strength and elasticity, comparatively with its very low specific gravity, than any other of British growth, and it is consequently applicable to purposes for which no good substitute has hitherto been found; the stocks of the musket of the soldier, and of the gun of the sportsman.

The buds of trees, of almost every species, succeed with most certainty, when inserted in the shoots of the same year's growth; but the Walnut-Tree appears to afford an exception; possibly in some measure because its buds contain, within themselves, in the spring, all the leaves which the tree bears in the following summer; whence its annual shoots wholly cease to elongate soon after its buds unfold; all its buds of each season are also, consequently, very nearly of the same age: and long before any have acquired the proper degree of maturity for being removed the annual branches have ceased to grow longer, or to produce new foliage.

To obviate the disadvantages arising from the preceding circumstances, I adopted means of retarding the period of the vegetation of the stocks, comparatively with that of the bearing tree: and by these means I became partially successful. There are at the base of the annual shoots of the Walnut, and other trees, where those join the year-old wood, many minute buds; which are almost concealed in the bark; and which rarely, or never, vegetate, but in the event of the destruction of the large prominent buds, which occupy the middle, and opposite end of the annual wood. By inserting in each stock one of these minute buds, and

one of the large and prominent kind, I had the pleasure to find that the minute buds took freely, whilst the large all failed, without a single exception. This experiment was repeated in the summer of 1815, upon two yearling stocks which grew in pots, and had been placed, during the spring and early part of the summer, in a shady situation under a north wall; whence they were removed late in July to a forcing house, which I devote to experiments, and instantly budded. These being suffered to remain in the house during the following summer, produced from the small buds, shoots nearly three feet long terminating in large and perfect female blossoms, which necessarily proved abortive, as no male blossoms were procurable at the early period in which the female blossoms appeared: but the early formation of such blossoms sufficiently proves that the habits of a bearing branch of the Walnut Tree may be transferred to a young tree by budding, as well as by grafting by approach.

The most eligible situation for the insertion of buds of this species of tree (and probably of others of similar habits) is near the summit of the wood of the preceding year, and of course, very near the base of the annual shoot; and if buds of the small kind abovementioned, be skilfully inserted in such parts of branches of rapid growth, they will be found to succeed with nearly as much certainty as those of other fruit trees, provided such buds be in a more mature state than those of the stocks into which they are inserted.

The advantages, which may be obtained in the propagation of other species of trees by procuring buds for insertion in a more mature state than those of the stock, are snf-

ficient to deserve some attention, and are not, I believe, at all known to gardeners and nurserymen. The mature bud takes immediately with more certainty under the same external circumstances: it is much less liable to perish during winter; and it possesses the valuable property of rarely or never vegetating prematurely in the summer, though it be inserted before the usual period, and in the season when the sap of the stock is most abundant. I have, in different years, removed some hundred buds of the Peach Tree from the forcing-house to luxuriant shoots upon the open wall; and I have never seen an instance in which any of such buds have broken and vegetated during the summer or autumn; but when I have had occasion to reverse this process, and to insert immature buds from the open wall into the branches of trees growing in a Peach-house, many of these, and in some seasons all, have broken soon after being inserted, though at the period of their insertion the trees in the Peach-house had nearly ceased to grow. The result was, in both the preceding cases, in opposition to my expectations; but it appears necessarily to have been occasioned by the mature bud having naturally sunk into a state of repose preparatory to its long winter sleep, previously to its having been removed; and by the more excitable state of the powers of life in the bud taken from the open wall.

If the mature buds of the Peach Tree, when taken from the forcing-house, contain blossoms, these may be carried a great distance, and still afford fruit in the following spring. I have thus readily obtained fruit from blossoms sent me from the vicinity of London; and I entertain no doubt of the practicability of obtaining fruit from blossoms sent from

Paris, or even from the south of France, if properly packed. In such cases it would be necessary to pare the wood of the bud thin, instead of wholly extracting it: and this will sometimes be found expedient, when buds are to be taken from a Peach-house, in which the fruit has been made to ripen early in the summer, to be inserted in the open air.

XXVIII. *On the Cultivation of* Succory, *or* Wild Endive. *By Mr.* Isaac Oldaker, *F. H. S. Gardener to His Majesty the Emperor of all the Russias.*

Read April 7th, 1818.

The *Succory* is well known and much used on the continent of Europe, where sheds or cellars, for preserving vegetables in winter, are used: it is little known at present in England, and is not noticed, as an article for the garden, by Miller, or any of our English writers on Horticulture. Therefore a short account of its culture, if approved of by the Members of the Horticultural Society, may be entitled to a place in their *Transactions.* It is used as a salad, being brought to perfection any time during the winter and spring months, when Lettuce and endive are scarce. It is the *Cichorium Intybus* of Linnæus, and is a native of the British Islands, growing plentifully in waste land: was regarded as a weed, but of late has been occasionally cultivated as early fodder for cattle. It is sometimes called Chicory, from the French name *Chicorée.* It is perfectly hardy, and is perennial; but as the young radical leaves are the only part used for the table, it is necessary to raise new plants of it each season. In its wild state, these leaves are small, but under cultivation they become large and succulent, and vary very much in their shape and appearance. By the French Gardeners it is called, when blanched, *Barbe-de-Capucin.*

It should be sown in the end of June or beginning of July, on a rich piece of ground, broadcast, in the same manner as Endive; when the leaves begin to cover the ground, thin out the plants, leaving those that remain on the beds from three to four inches apart; those pulled out may be planted into other beds, at the same distance as those which are left to remain; keep them clear from weeds, and if the leaves grow very strong, and shade the roots much, cut them off within one inch of the ground.

The end of September or beginning of October is the proper time to shift the roots; the leaves should be first cut off with care, so as not to destroy the hearts of the plants, then dig up the roots, shorten them, and plant them in pots or portable boxes, with a dibble very close together, in rich mould; give them water when dry, and shelter them in severe frosts, by a light covering of litter. After they are well rooted, the pots or boxes, as wanted, are to be removed into the mushroom house, or cellar, where they must be entirely excluded from light, in order to blanch the leaves, which will be effected in six or seven days. Succory will thrive in a heat of sixty degrees, but it is best to keep it in a lower temperature. If the roots are strong, each pot or box will bear cutting twice, after which they should be removed, and changed for the succession, as the leaves of the future growth become bitter.

XXIX. *An Account of the original Tree of the* Ribston Pippin, *still existing on the Estate of Sir* Henry Goodricke, *Bart., at* Ribston, *near* Wetherby. *Communicated by Sir* Henry Goodricke, *in a Letter to* Frederick Lumley, *Esq.; and laid before the Society by* George Henry Noehden, *LL. D. F. L. S. &c. Vice Secretary.*

Read April 7, 1818.

It will, no doubt, be interesting to the Society to receive some information concerning the original tree of the *Ribston Pippin*,* which is justly considered as one of the most valuable apples now in our gardens and orchards. Through the exertions of Lady Milner, an active and intelligent friend to Horticulture, I am favoured with the following authentic particulars from Sir Henry Goodricke, Bart. on whose estate, at Ribston, near Wetherby, in Yorkshire, that tree exists. From no better source could such intelligence have been derived, than from the actual owner, who

* Mr. Knight, the President of the Society, had expressed in one of his Papers, in the Transactions (Vol. II. p. 254,) a wish to know something of the history of this tree; and it will be satisfactory to him, not only to have that wish gratified, but also to see his notion respecting the origin of this tree confirmed. Mr. Knight's words are these: " I am not by any means satisfied that the original tree of the Ribston Pippin is not now growing in England; and that the seed from which the tree sprang, and not the tree itself, came from France: for I have never seen any plate of it, nor description of any apple very like it, in any foreign catalogue. A cutting from the root of the supposed original tree, might, I conclude, readily be obtained, and no effort to preserve so valuable a variety ought to be omitted."

seems to be in possession of all that is known respecting it. The Society, I am sure, will feel indebted to Sir Henry for that communication, and not less to the zeal of the fair correspondent, by whose means it was obtained. I will, to do it justice, give it in Sir Henry Goodricke's own words.

"Traditionary accounts," he observes, "are all which we have to guide us in the history of this tree. It is said, that some Apple seeds, or pips, were brought from Rouen, in Normandy, about one hundred and thirty years ago; that they were sown at *Ribston;* that five of the pips grew, two of them proving crabs, and the other three apples, which were all planted out, at *Ribston.* Two of the Apple trees are now growing, and produce fruit; one of them, the celebrated *Ribston Pippin,* which was blown down about the year 1810. The bark having been previously injured by cattle, the tree had decayed, so that the wind fractured the stem about seven feet from the ground, the head and branches hanging by that part of the bark, which remained sound. In this position it yet remains, sending out fresh and vigorous shoots in new directions. It yet bears fruit, but in decreased quantity, size, and flavour. For several years, it had not at any time produced a peck of apples. The year before it was blown down, it produced between three and four bushels, and when in its prime, which is within the memory of many persons now living, it was reputed a good bearer."

This is Sir Henry Goodricke's account, which is dated Ribston, March, 1818.

I had some time ago requested the Hon. William Herbert, who resides in the neighbourhood of Ribston, to

furnish the Society with what intelligence could be procured touching that tree, not knowing that any communication was to reach me from another quarter. He complied with my application, in the most obliging manner; but I did not receive the result of his investigation till some days after the account, above mentioned, had arrived. What Mr. HERBERT states is in substance, the same with the foregoing, and it cannot be otherwise, as it comes from the same fountain. He describes Ribston as situated between Knaresborough and Wetherby, and says, "the tree stands, or rather lies, in the grounds of Sir HENRY GOODRICKE, at a small distance from the house." The conclusion of his Letter is as follows. "The other tree, which is reported to have been raised at the same time (with the Ribston Pippin) is still a good bearer, and I am told that the fruit is good. I understand, that it is the opinion of some persons, in the neighbourhood, that the old Ribston Pippin is not a seedling, but a grafted tree. I send you herewith grafts from the old Ribston Pippin, and also from the sister tree, and I also send what will enable you to ascertain whether the old Ribston Pippin is a seedling, or not, a slice of the old root with suckers adhering to it, which have some young fibres hanging from them; and with common attention they will certainly grow."

The grafts alluded to, came to hand at the same time with Mr. HERBERT's letter; and among them were also some suckers from the root. The latter being planted in the Society's garden, will perhaps assist us in ascertaining the question, whether the Ribston Pippin was originally a seedling or a grafted plant.

XXX. *On a method of Forcing Garden* Rhubarb. *By Mr.* Daniel Judd, *F. H. S. Gardener to* Charles Campbell, *Esq. of Edmonton.*

Read May 5, 1818.

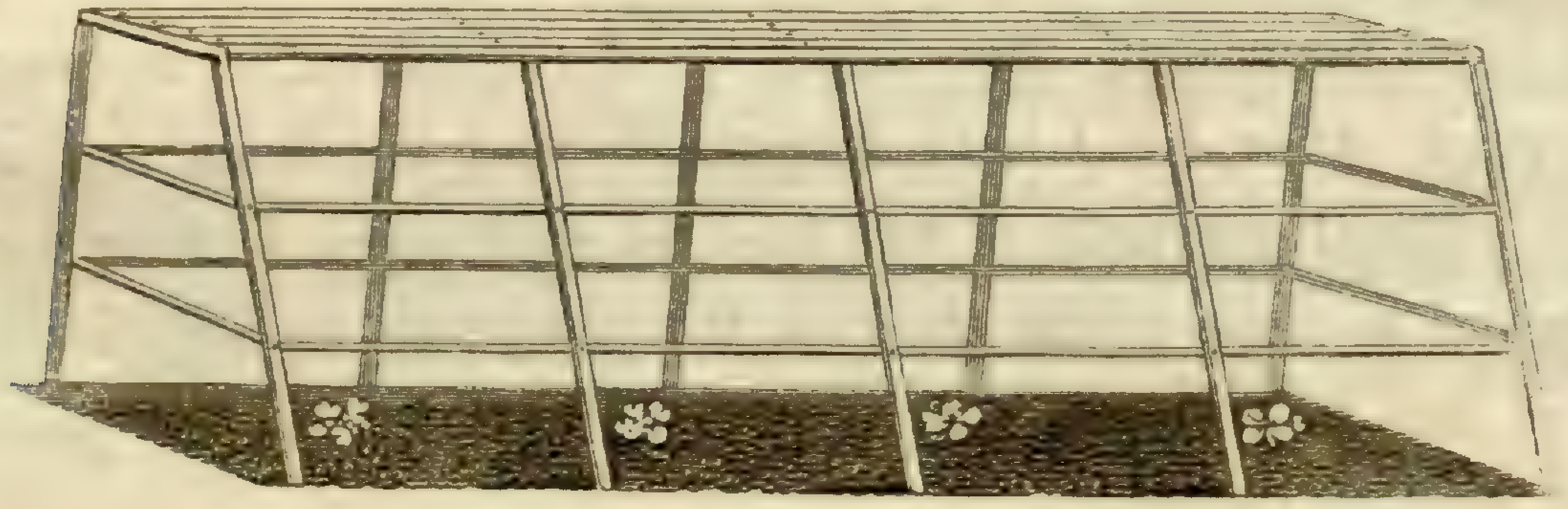
The sort of *Rhubarb* which is usually grown for culinary purposes is the *Rheum Rhaponticum*, but having found the *Rheum Hybridum* to possess much greater excellence, I have entirely expelled the former from the garden under my charge, and only cultivate the latter.

When about to plant it, I first trench the ground two spades deep, giving it a good dressing of rotten dung at the same time, and with a trowel or dibber, put in the plants three feet apart. One row of it is sufficient for my purposes; but if so great a quantity of the article is required as to make more rows necessary, they must be at considerable distances from each other, for I have frequently had the leaves of my plants extend upwards of five feet on each side. I have seen it planted as close as the *Rheum Rhaponticum* usually is, and then it has failed to produce so largely as when the plants are at greater distances.

My first attempt to force this Rhubarb was made by covering the crowns with the common garden pots, called twelves, having their holes stopped. Under these it came very fine and quickly, but was much broken by the sides and top of the pots. After it was all well up, the dung and pots were entirely taken off, and large hand-glasses were

substituted in their stead, thickly covered with mats every night, and in dull weather. This process I found greatly to improve their flavour, and it gave me a regular supply till that in the open air was ready for use. The following year I had large pots made on purpose, without holes, but these broke the shoots almost as much as the first, for this sort of Rhubarb grows so very luxuriantly, that it is impatient of such confinement.

My success by the above method not being equal to my wishes, I have this season adopted an open frame of wood-work, made by driving stakes into the ground, opposite each other, on each side of the bed, alternately with the plants, leaving a space two feet wide at bottom, from side to side; the stakes, at three feet high above the ground, are drawn together by cross pieces, so as to be only 15 inches apart at the top. The annexed sketch, with the following details, may serve to explain my plan.



To the sides and top of the frame-work are fixed stout laths to prevent the dung from falling upon the plants. The frame being thus prepared, the dung is placed at the sides and ends of it, in the manner of a lining, eighteen inches thick; and the top is covered over with long litter. With this treatment the Rhubarb has come up very regularly, of

excellent quality, and wants far less attention than was required by my former method; for the frame-work renders hand-glasses, or any other cover, unnecessary. Care should be taken to lay the dung in such a manner that the top may be partly, or wholly taken off, at any time, for the purpose of gathering, or examination, without disturbing the sides. That this is a superior method of forcing the ***Rheum Hybridum***, this year's experience has satisfied me; but still the forcing by pots will answer very well for any of the smaller growing species.

I have never found any difference between using dung fresh from the stable, and that which had undergone fermentation, provided it was not suffered to heat violently after its application to the frame. I do not permit the internal heat of the hollow space, above the plants, to rise above 60° of FAHRENHEIT's scale, between 55° and 60° being the proper medium. If it should become too hot, that may easily be corrected by making two or three large holes through the top of the dung into the space above mentioned. When pots are used, if the dung is found to be heating too much, the only method is to turn the whole over, and this should be particularly attended to, as the shoots rise quicker than when under the frame, and are sooner scalded than those of sea-kale.

To those who dislike the trouble of either frames or pots, it may be useful to know that Rhubarb will come in much quicker, by being covered about six inches thick, with light litter; care should be taken, in putting it on, and removing it, that no injury be done to the plants.

XXXI. *Account of a Method of growing* Cucumbers, *on Heat, as practised in the Garden of Mrs.* Dare, *at Cranbrooke House, near Ilford, in Essex. By Mr.* George Mills, *Gardener to Mrs.* Dare.

Read May 5th, 1818.

The *Cucumbers* shown to the Society on the 17th of March were cultivated on a dung-bed, under a common frame, according to the method here described. Well preparing the dung is of the greatest importance in forcing the Cucumber, and if not done before it is made into a bed, it cannot be done after, as it requires turning and watering to cause it to ferment freely and sweetly: fresh dung from the stable will require at least six weeks preparation before it will be fit to receive the plants. A month before it is made into a bed, it should be laid into an heap, turned three times, and well shaken to pieces with a fork, and the outsides of the heap turned into the middle, and the middle to the outsides, that the whole may have a regular fermentation; and if any appear dry, it should be made wet, keeping it always between the two extremes of wet and dry. A dry spot of ground should be chosen to prepare the dung on, that the water may drain away from the bottom of the heap. The dung having been a month in heap, I make the bed as follows: I form a stratum one foot high, of wood of any kind, but if large, the better (old roots of trees, or any other of little value will do;) this is to drain the water from the bottom of the bed; for,

after a month's preparation, with every care, it will frequently heat itself dry, and require water in large quantities, which, if not allowed to pass off freely, will cause an unwholesome steam to rise, in which the Cucumber plant will not grow freely: on this bottom of wood I make the bed, four feet high with dung, gently beating it down with a fork; this is done about the first of November, and by the month of February, the four feet of dung will not be more than two feet thick, which, with the foot of wood at the bottom, will make the bed three feet high; this I consider a good height, for if lower, it cannot be so well heated by linings, which is the only method of warming it in the months of February and March, as by that time the first heat of the bed will have quite declined.

Having made the bed, I put on the frames and lights, which I shut close till the heat rises. I then give air night and day, sufficient to allow the steam to pass off, and once in two days, I fork the surface over, about nine inches deep, to sweeten it, and if, in the operation, I find any part dry, I carefully wet it. The bed being quite sweet, I prepare it for the mould, by making the middle about eight inches lower than the sides, as the sides are liable, from the weight of the frames, to settle faster than the middle, which often causes the hills of earth to crack, by which the roots of the plants are greatly injured.

Under the centre of each light, I put one solid foot of earth, the top of which is then within nine inches of the glass, and the top of the plants, when planted in it, will be within three inches of the glass.

The earth I grow them in, is half bog or black mould, got

from a dry heathy common, and half leaf mould; after lying twelve months in a heap, the compost is fit for use.

I sow the Cucumber seed on the 14th of October in a one-light frame, on a bed of hot dung, prepared as above directed, and as soon as the seed leaves of the plants are fully expanded, I transplant them, singly, into pots of the 48th size, in the earth before mentioned, and give them a little water.

I give the frame air night and day; the heat I wish to have in the frame is from 65 to 75 degrees of FAHRENHEIT'S thermometer; with this heat, and water, as the earth in the pots becomes dry, and a little air night and day, so as to keep the internal air in the frame sweet, and fluctuating between the degrees of heat abovementioned, the plants will be fit for finally transplanting out by the 14th of November, into the fruiting frames. In these frames I wish to have at all times from 70 to 80 degrees of heat, which I regularly keep up by applying linings of hot dung, prepared one month previously, in the same manner as that for the beds. For the first month I cover the glass with a single mat only; and as the nights become cold, I increase the covering, using hay, which I put on the glass, and cover that with a single mat. I regulate the heat at night by the warmth of the glass under the hay, for when the glass is warm, which should be in two hours after covering up, a little air is required.

When the glass and hay covering are warm, which is easily known by putting the hand under the hay on the glass light, the internal heat of the bed will be about 78 degrees, in which degree of heat, the Cucumbers shown to the Society have grown in length, in 16 hours, one inch and a quarter. I give a little water round the insides of the frame as often as I find

them dry, which causes a fine steam to rise, and I think it better than watering the mould, for if this latter practice is often repeated in winter, when the sun's power is insufficient to absorb the moisture, and the glasses can be but little open, to allow the damp to pass off, the earth, in a few weeks, will lose its vigour, and the roots of the plants will perish. Great care should also be taken, at this season, not to injure the roots by too much heat, which is not less detrimental than too much moisture; they can only be secured by keeping up a regular warmth, just sufficient to expel the damp, which arises in the night, from the fermenting dung. My usual times of giving fresh air to the frames, and permitting the foul to escape, in the winter months, (that is, from the middle of November to the middle of February) is as follows: between eight and nine in the morning, I raise the lights, and let the confined air pass off, shutting them again; about ten I give a little air; at eleven more; at one I lower the lights a little, and between three and four, I close them entirely. About two hours after the covering of hay has been put on, I give a little air for the night, as before directed. Should the weather be changeable, the lights must be raised or lowered more or less, as circumstances may require; but some air about the times of the day above mentioned, is absolutely necessary to keep the plants in a free growing state.

XXXII. *Some Observations on the Treatment of* Pear Trees, *by Mr.* Charles Harrison, *Corresponding Member of the Horticultural Society, and Gardener to* James Stuart Wortley, *Esq., of* Wortley Hall, *near* Sheffield. *Communicated by* George Henry Noehden, *LL. D. F. L. S. &c. Vice Secretary.*

Read May 5, 1818.

I laid before the Society, some time ago, an account of the manner in which Mr. Charles Harrison manages his fruit trees, drawn up according to the data, which I had collected from him in conversation.* He has lately addressed to me, in a letter, some Observations upon the Treatment of the *Pear Tree,* which being connected with the subject I had in my former Paper spoken of, in a more general way, I have great satisfaction in communicating, as it tends to corroborate what was there advanced. Mr. Harrison states that his Pear Trees, under the treatment alluded to, thrive and prosper beyond what may be conceived, never failing to produce abundance of fruit. It consists, partly, in the mode of pruning, and partly in the application of a certain ointment, or composition, by which all insects that may infest the trees, are destroyed, and the latter kept in a clean and healthy condition. He says that he has frequently been solicited by those, who have seen the effects of his method, to make it known, but he has hitherto refrained from publishing it, intending to communicate it, in

* See page 37.

the first instance, to the Horticultural Society. The following are his instructions transcribed in his own words. The sketch of a branch is subjoined to his letter, to which his directions for pruning refer.*

"The trees may be pruned any time from December to February, and the spur at letter A, which produced fruit last season, is cut down to the bud at D, as expressed in the annexed figure. Letter B, is the two year old bud, which will produce fruit next season. Letter C, is the one year old bud."

"*The Composition.*"

"To four gallons of water, add one pound of sweet or soft soap; two pounds of common sulphur; four ounces of tobacco; four ounces of black pepper. Let it be boiled together for twenty minutes, and used as directed."

The mode of applying this composition Mr. Harrison had mentioned in another part of his letter, namely, it is to be laid on "with a painter's soft dusting brush," and in a tepid state, what is called "new-milk warm." Respecting the pruning, I have to remark, that what Mr. Harrison calls the bud at D, is what I have in my former paper, denominated the embryo of the future spur. The next season, after pruning, it assumes the shape C; the following year that of B. and shows fruit the third spring. In his conversation with me, Mr. Harrison did not express himself so distinctly; but said in general terms, that the young spur required a whole year for being perfected, and would bear fruit the

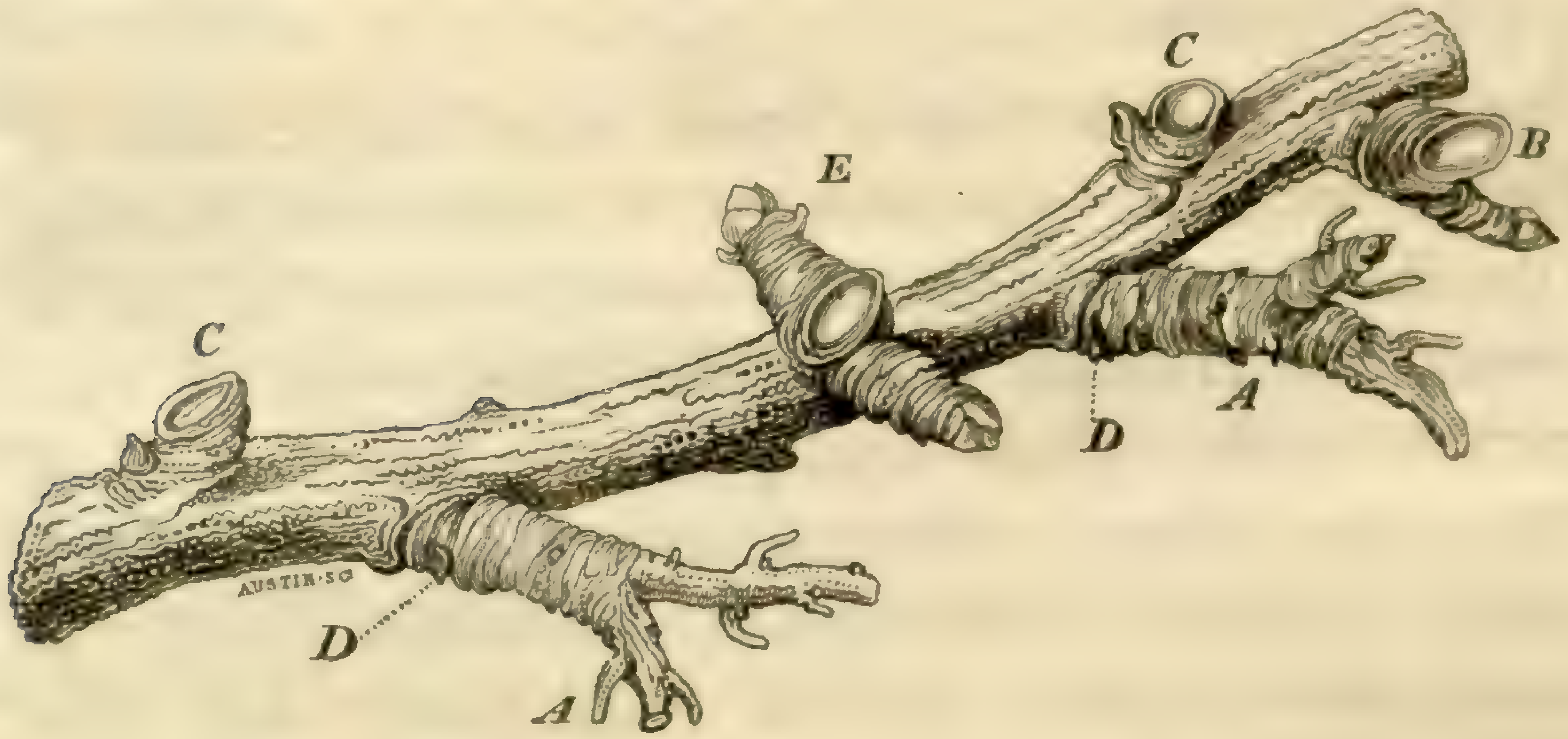
* See page 153.

next. Though these expressions vary, there seems to be, in fact, no material difference between them. For, supposing the tree to be pruned in January or February, 1819, it will be a year's space to the same period in 1820, and you may, without taking any great latitude, consider that two springs, viz. that of 1819 and 1820 are comprehended in it: the spur would then show fruit in the spring 1821. This is nominally the third spring, after pruning, as Mr. Harrison terms it; but in reality, only a year's space has elapsed between the time of pruning, and the spring, when fruit is shown; which is the manner in which I have expressed it.

Note by the Secretary.

A subsequent correspondence with Mr. Harrison, and the inspection of some boughs, treated in the manner described, has enabled me to explain more in detail the course pursued by him in his method of pruning. The old spur marked A, has at its base, close to the branch, the embryos of future buds, at the lowest of which, marked D, this old spur is cut off in February; that embryo, in the end of the ensuing season, becomes the bud marked C, (which state seems to be that at which Dr. Noehden's period of computation commences); during the subsequent year, this young bud becomes a fruiting bud, and in the third year, bears its produce, after which it is entirely cut off, in conformity with the system detailed. From the specimens of branches sent up, it appears, in some cases, that two embryos are allowed to form themselves into buds at the base of the

reduced spur, as at E. Mr. Harrison states that the same mode of treatment, exercised upon the Pear, is equally successful with the Plum and Cherry. The beneficial effects of the composition have been admirably proved, by the exhibition at a Meeting of the Horticultural Society, of diseased branches restored to a healthy state; it however requires two years to effect a perfect cure in very bad cases.



XXXIII. *On a Method of* Forcing Rhubarb *in Pots. In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read May 5, 118.

My Dear Sir,

Understanding that a Paper upon the *Culture of Rhubarb,* for culinary purposes, will be read at the Meeting of the Horticultural Society to morrow, I address to you an account of a mode of Forcing that plant, which I have practised in the present spring with much success; and which, being different from that communicated to you, may possibly be found, under some circumstances, equally, or perhaps more, eligible. And as other plants, which have roots of similar construction, may not, improbably, be forced with advantage by the same mode of treatment, I shall concisely state the circumstances which induced me to adopt it.

The root of every perennial herbaceous plant contains within itself, during winter, all the organizable matter, which it expends in the spring in the formation of its first foliage and flower stems; and it requires neither food nor light to enable it to protrude these, but simply heat and water; and if the root be removed entire, as soon as its leaves become lifeless, it will be found to vegetate, after being replanted, as strongly as it would have done, if it had retained its first

position. These circumstances led me, in the last winter, to dig up the roots of many plants of the common Rhubarb (which I had raised from cuttings in the preceding spring) and to place them in a few large and deep pots, each pot being made to receive as many as it would contain. Some fine sandy loam was then washed in, to fill entirely the interstices between the roots, the tops of which were so placed as to be level with each other, and about an inch below the surface of the mould in the pots, which were covered with other pots of the same size, inverted upon them: being then placed in a vinery (in a situation where nothing else could be made to thrive, on account of want of light), and being copiously supplied with water, the plants vegetated rapidly and strongly; and from each pot I obtained three successive crops, the leaf stalks of the two first being crowded so closely as nearly to touch each other over the whole surface of the pots. As soon as the third crop of leaves was broken off, and a change of roots became necessary, those taken from the pots were planted in the open ground, their tops being covered about an inch deep with mould, and I have reason to believe, from present appearances, that they will live and recover strength, if given a year of rest, to be fit for forcing again. Should they, however, perish, it is of very little consequence; as year-old roots, raised from cuttings, or even from seeds, sowed in autumn in rich soil, will be found sufficiently strong for use.

The heat of a hot-bed, a kitchen, or other room, and, on the approach of spring (probably at any period after the middle of January) a cellar, will afford a sufficiently high temperature; and the advantage in all cases will be that of obtaining from one foot of surface as much produce as in the natural

state of growth of the plants would occupy twenty feet; and in the shaded space of the vinery or peach-house, not applicable to other purposes, and without incurring any additional expense in fuel, or doing injury to the soil, a succession of abundant crops may be raised.

I am dear Sir,

sincerely yours,

THOMAS ANDREW KNIGHT.

Soho Square, May 4, 1818.

XXIV. *Upon the Pruning and Management of* Transplanted Standard Trees. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read June 2, 1822.

When a tree is transplanted, it loses, almost necessarily, a considerable part of its roots: and as these, in every healthy subject, are nicely proportioned to the branches, the advantages of retrenching the latter are obvious, and well known to every gardener. But relatively to the mode of retrenching the branches, and the extent of retrenchment, that is beneficial, there is much discordance in the opinions and practice of different gardeners; and often still more between the gardener and his employer; the latter wishing to preserve the bearing branches, that he may, at an early period, obtain a crop of fruit, and the gardener wishing to head down the tree, that he may see it shoot with vigour. Neither mode of practice is, I think, in its full extent, quite eligible in the greater number of cases; the one being too prejudicial to the growth of the tree, by occasioning the production prematurely, of an useless profusion of blossoms; and the other being, even when most successful, attended with an unnecessary loss of time: and I have found, in very extensive experience, that transplanted trees generally succeed permanently best, and as standards take the best forms, when their lateral branches, instead of being suffered to retain their whole length, or pruned off closely, are all shortened to the length of a few

inches, and the top of the tree reduced to a single annual shoot. Under these circumstances the leaves become dispersed upon the stem, so as to afford nutriment to the bark of different parts of it; and the power of the wind to prevent the tree re-establishing itself is small (owing to the situation of the leaves), comparatively with the extent of the foliage, which the tree exposes to light. The trees under this mode of treatment also bear as much fruit as they are capable of feeding, as soon as under any other, that I have hitherto tried, or seen; and within three or four years their branches generally become more widely extended than those of similar trees, which are planted without being pruned. The same mode of pruning is equally well adapted to fruit and forest trees; and oaks, which I have planted when ten or twelve feet high, have not only begun immediately to grow with luxuriance; but they have within a very few years wholly lost the character of transplanted trees.

The great error of modern practice is that of suffering, when the trees are not headed down, many small branches to form the summit of the transplanted tree; which branches expend its sap in the production of tufts of leaves, where those, owing to their distance from the roots, operate least beneficially in the performance of their proper office, and most injuriously by being most exposed to the influence of winds.

Whenever the roots of transplanted trees have been very much injured, or have been very long out of the ground, the number, as well as the extent of the lateral branches, should be reduced; and not more than a few inches of the leading annual shoot should be suffered to remain; but in all cases where trees are to be sent a great distance, this retrench-

ment of their branches should be made in the nursery from which they are to be removed; and, if it be properly executed, trees may be conveyed to great distances, under more disadvantageous circumstances than is usually supposed, without endangering life, provided they be subjected to proper subsequent management.

I received in the last spring some apple trees from America; which were forwarded to me from London by a wrong waggon, and consequently did not arrive till near the middle of April, and many weeks after the period at which I ought to have received them. The whole of them appeared perfectly lifeless and dry, and much better fitted for fire-wood than for planting; and I scarcely entertained the slightest hope of being able to recover a single plant. I nevertheless resolved that no trouble should be spared in making the experiment.

The American nurserymen had pruned the trees much in the way I wished (though in a very rough and careless manner, and obviously without any other object in view than convenience in packing them); and I had therefore little more to do in pruning them than to take away such branches as were broken and wholly dead. The trees, which were about four feet high, were then planted in a situation where they were perfectly skreened from the morning sun, and just as much water was given as was sufficient to close the mould to the roots. Their stems were then sprinkled with water, by an engine, sufficiently to wet the bark; and this was repeated at six o'clock every morning through the months of May, June, and July; but no water was given immediately to the roots, previous experience having led me to believe, that

excess of moisture is in such cases, generally injurious, and often fatal.

About midsummer a few of the trees began to exhibit some feeble symptoms of life; several subsequently shot vigorously, some to the length of eighteen inches; and out of sixty-four trees, I lost only three. They succeeded, in the aggregate, better than other trees of nearly the same age, which were only removed from a contiguous nursery, but which were not sprinkled with water; the season having proved cold and dry, and consequently extremely unfavourable to transplanted trees.

I had previously seen, in other instances, though never in so apparently hopeless a case, the good effects of sprinkling the stems and branches of transplanted trees before the sun began to shine upon them in the morning, both in the forcing-house and in the open air. In the forcing-house, I have found that water may be also thus applied with advantage in the evening as well as in the morning; but, in the open air, I have had reason to think its operation injurious, when the succeeding night has proved cold.

XXXV. *Description of the Different Varieties of* Broccoli, *with an Account of the Method of Cultivating them. By Mr.* Hugh Ronalds, *of Brentford, F. H. S.*

Read June 2, 1818.

Miller, in his Gardener's Dictionary, under the article *Brassica,* supposes the few *Broccolis* that were then known to have proceeded from the Cauliflower, which, he says, was imported from the Isle of Cyprus; he mentions white and purple Broccoli as coming from Italy. From these two sorts, it seems reasonable to conjecture, have arisen all the subsequent kinds, either by accidental variations from seed, or by purposely mixing the farina of the different varieties. Supposing this to be the case, I proceed to give as distinct an account as I can of those sorts which are now held in general estimation, taking them in the order in which they come to perfection for the table.

1st. *Purple Cape*, or *Autumnal Broccoli.* This has a close compact head of a beautiful purple colour. If the season is showery, and it is planted in good ground, it comes as large as a Cauliflower. Sown about the middle of May, beginning and end of June, it will produce in regular succession, from August to December, or until frost destroy the heads, which are tender; if sown in July and August, and the winter is mild, it brings good heads in spring, as

was testified by the fine specimens exhibited by Mr. Maher, at the Second Meeting of the Horticultural Society in April last; when sown in the beginning of September, and the plants are preserved in frames, as Cauliflowers, fine heads may be expected in the months of June and July. Thus, by good management, this kind may be in use during the greatest part of the year, but it is not hardy enough to be depended on for the winter months. The plants should be placed in the garden, about two feet apart, in each direction; they grow from one foot to one foot and a half in height. The leaves are nearly entire, erect, concave, lobed at bottom, and much waved, short, and regularly surrounding the head; the veins, and mid-rib are stained with purple, which stain is a test of the plant being true. The head is exposed to the view in growing, in general it is not very large; as it enlarges the projecting parts of the flower shew a greenish white, mixed with the purple colour. When boiled, the whole flower becomes green. The largest and finest heads I have seen of this sort, were grown by Mr. Padley, at the Royal Gardens, Hampton Court, where most of the kinds are in general produced very true and fine.

2nd. *Green Cape*, or *Autumnal Broccoli.* This sort differs but little from the preceding, except in colour, and in the heads, as well as the plant, proving in general larger. The leaves are long and narrow, much like those of a Cauliflower, they are very little waved, and, consequently, have a general appearance of smoothness; the veins and mid-rib are green. The head, which has some resemblance to a Cauliflower, is of a greenish white colour, and is usually somewhat covered by the leaves. These two sorts are very sportive, running

much into each other, and have a strong tendency to degenerate, yet are quite distinct, and when so, very beautiful. The greatest care should be taken in saving the seeds from plants which are perfectly true. This remark applies generally to all the sorts.

3d. Grange's *early Cauliflower Broccoli.* If this sort is sown at three different times, from the beginning of May until the end of June, it will bear its heads in succession from Michaelmas to Christmas, if the weather is not severe. The leaves covering the head defend it from slight attacks of frost, they have long naked foot-stalks, are wider and shorter than those of the Green Cape, are lobed at bottom, but not much waved; the veins and mid-rib are whitish green; the head is large and quite white. It should be planted at about two feet apart.

4th. *Green Close-headed Winter Broccoli.* This is a new and a good sort. I think it is a seedling from the Green Cape, which it closely succeeds in coming into use: its peculiarity is, that it continues to bear during the whole of the winter, if the weather is mild. From a piece planted at one time, the seeds having been sown the end of May, I could this season have cut heads fit for use, through the months of November, December, January, and February. When planted out, the proper distance between the plants is from one foot and a half to two feet. The plants are dwarf; leaves spreading, and moderately indented, they are numerous, much waved, and large; the veins are white; the flower grows exposed, nearly resembling that of the Green Cape in appearance, and does not attain a great size.

5th. *Early Purple Broccoli.* A very excellent kind, of a

deep purple colour; if it is true, it is close-headed at first; afterwards it branches, but it is apt to come green and too much branched, especially in rich ground. When sown in April, it begins to produce in November, and continues bearing heads and sprouts throughout the winter, in mild seasons; if sown in June it produces abundance of sprouts in March and April. Its height is from two to three feet, growing strong and tall; the leaves are much indented, of a purplish green colour, they spread out wide, but not long, though the stalks are so; the head is quite open from the leaves: small leaves are sometimes intermixed with the head; the plants produce sprouts of flowers from the alæ of the leaves. It should be planted three feet apart, in rich ground.

6th. *Early White Broccoli.* The heads of this sort are of a close texture, and of a pure white colour. To obtain them fine and early, the seed should be sown in February, or beginning of March, on a slight hot bed; the plants, when, about three or four inches high, must be transplanted into beds of light rich earth, three or four inches apart, and defended from the frost and cold nights by a mat covering; they will be strong enough to plant out at two or three feet distance, by the end of April: under this treatment, they will produce beautiful heads in November, and continue to do so until Christmas, if the weather is tolerably mild. This sort, as well as several others, is sometimes cut in considerable quantities by the market gardeners, previous to an expected frost, and kept in sheds or cellars, for the supply of the market. It grows to about three feet in height; with erect, concave, light green, and nearly entire, leaves.

7th. *Dwarf Brown Close-headed Broccoli.* From its resemblance, I take this to have sprung from the sulphur-coloured Broccoli, from which, however, it differs, by coming in earlier, as well as in the shape and colour of its head; the leaves are also shorter and broader than those of the sulphur-coloured, they are small, not much waved, dark green with white veins, they grow upright, and do not cover the head at all. Most of the crowns are green on their first appearance, but soon change to large handsome brown heads. If sown about the middle of April, it is in use through March and April. Two feet distance is sufficient for the plants, when put out.

8th. *Tall large-headed Purple Broccoli.* This sort produces large tall purple heads, at two and three feet in height. If sown towards the end of March, it will prove an useful kind in March and April. The plants should be three feet asunder in good ground.

9th. *Cream-coloured,* or *Portsmouth Broccoli.* This is a very noble sort, exceeding all the others in size. It is of a buff or cream colour, and has a very compact firm head; its leaves are large and broad, with white veins; they spread out widely, but the small centre leaves cover the flower. A head sent by Mr. Oldaker from Sir Joseph Banks's to the Horticultural Society on the fifth of May last, measured more than two feet in circumference, although it was quite close. Seeds sown in the middle of April will be in perfection during the following February, March, and April. It bears near the ground. The plants should be planted three feet asunder.

10th. *Sulphur-coloured Broccoli.* A hardy and valuable

sort; if sown in April, it produces in the following April, and beginning of May, fine, compact, conical, sulphur-coloured heads, some of them slightly dotted with purple. The leaves have long footstalks, are much indented, and of a blueish gray colour. Two feet distance will be sufficient for the plants to grow well.

11th. *Spring White,* or *Cauliflower Broccoli.* This should be sown in March, and planted out at three feet distance. When in good ground, it will produce very fine heads, perfectly white, throughout the months of April and May. It grows very robust, with large leaves, flat and narrow, with thick veins; the leaves encompass and compress the head so as to render it generally invisible when fit to cut, which is a great preservative from the frosty mornings common in the spring months. This sort was uncommonly fine this season at Spring Grove.

12th. *Late dwarf close-headed Purple Broccoli.* This is the latest purple Broccoli, being in perfection throughout April and the greatest part of May. The plants seldom rise above a foot in height; the flower at first shews small and green, but soon enlarges, and changes to a close conical purple head; the leaves are short and small, dark green, with white veins, much sinuated, deeply indented, and forming a regular radius round the flower, giving the whole plant a singular and beautiful appearance. The seed should be sown in April, and the plants must stand from one foot and a half to two feet apart.

13th. *Latest Green,* or *Siberian Broccoli.* This is the latest and the hardiest of all the Broccolis I have met with, for the severest winters will not destroy it. If sown towards the

end of April, it will produce large compact green heads during the whole succeeding May. The leaves are much undulated and indented, narrow and long, with a tinge of purple in the stems. Two feet distance is sufficient for the plants. I believe this is called by some the Danish Broccoli.

These very useful and delicious vegetables having been long and successfully cultivated, little remains to be said respecting their management. It being, however, desired, I offer a short view of that mode of treatment which has appeared to me to succeed best, it being similar for all the different sorts.

The seed beds should be prepared of light rich mould, well dug, and if dry, watered the evening before sowing. The seeds, must be thinly sown, and the beds should be covered with mats or litter till the plants appear, the covering may then be removed, and the plants watered occasionally as the state of the weather requires; should that continue very dry, the best method is to transplant, when the plants are about two or three inches high, into other beds about four inches asunder. Being several times refreshed by sprinklings of water, they will, in a fortnight or three weeks, be sufficiently strong for a second remove. This mode offers some advantage in giving time to clear off any crops of peas, &c. thereby obtaining ground which could not otherwise be conveniently had at the first season of planting out. The four first sorts on the list, which I consider as congeners, should be only once transplanted, as the check their removal occasions is apt to produce the heads prematurely, which, in that case, will be small, and indifferent in quality. If the season is showery, it will be needful to cover the beds as soon as sown, with net-

ting to keep off the birds, also to sprinkle the plants when they appear, with lime water, or to strew on them fresh slacked lime, to destroy the slugs. In this case, when the plants are six or eight inches high, they may be planted at once at the distances recommended for each sort.

In old gardens, infested, as is often the case, with an insect which in summer insinuates itself into the roots of all the Brassica tribe, and causes a disease usually called the club, trenching the ground deep enough to bring up four or six inches of fresh undisturbed loam or earth, will probably bury the insects too deep for mischief and provide fresh ground for the benefit of the plants. In gardens much exhausted by reiterated cropping, if this mode cannot be adopted, a good quantity of fresh loam from a common or field, dug in, would materially improve the Broccoli, and be of lasting use to future crops.

Broccoli in general succeeds best in a fresh loamy soil, where it comes, I think, more true in kind, and is hardier, without dung: but if this situation cannot be had, deep digging, with plenty of manure is the only remaining alternative to procure good crops.

I believe soap ashes dug into the ground in considerable quantities, to be a good preservative from the club, and if the roots of the plants, just previously to planting, are dipped and stirred well about in mud of soap ashes with water, its adherence will, in a great measure preserve them from attack; perhaps a mixture of stronger ingredients, such as soot, sulphur-vivum, tobacco, &c. would be still better.

Although it must be acknowledged that Broccolis come larger and finer on the spot where they are planted, yet it is

certainly a prudent way to take up at least a part of all the nine last mentioned sorts, in the beginning of November, disturbing the roots as little as possible, and lay them in slopingly, with their heads towards the north, only a few inches above the ground, and about eighteen inches asunder. By this means, the crown of the plant lying low, is soon covered and protected by the snow, which generally falls previously to long and severe frosts; the plant is also rendered tougher in fibre, and hardier, by the check received in this last removal.

XXXVI. *Description of, and Observations on the* Coccus Laricis, *or* Mealy Insect, *which infests the* Larch. *In a Letter to the* Secretary. *By Sir* Oswald Mosley, *Bart. F. H. S. &c.*

Read July 7, 1818.

Dear Sir,

The cultivation of Timber trees, in a national point of view, is an object of such importance, that it imperiously demands the attention of every British subject, and although doubts may be entertained, whether it falls within the peculiar province of the Horticulturist, yet the Members of the Horticultural Society cannot, I should hope, be accused of encroaching upon the pursuits of others, if they occasionally extend the sphere of their survey beyond the limits of the garden to the more gigantic vegetables of the forest.

It is under this impression, that I now transmit to you the following account of an Insect which has been very detrimental to the Larch Fir, more especially when growing upon rich loamy soils. My observation was first attracted by the similarity which its mealy web bears to that of the Aphis lanigera, and I imagined, from this circumstance, that it might have been allied to that insect. Upon a closer inspection, however, this error was soon detected: and I discovered that the mealy appearance upon the bark, and leaves of the Larch, was

produced by a very minute species of *Coccus*, the form and habits of which I will briefly state. In size it does not exceed that of a pin's head; its form is ovate narrowing towards the abdomen; body convex, and surrounded by deep annular wrinkles; the full grown female insect is of a slaty purple colour: the eggs of a pale orange; its proboscis is situated very low in the breast, and appears to be the instrument through which the cotton-like web, in which it envelopes itself, proceeds. The female, when pregnant, swells to such a bulk, that the legs and antennæ can scarcely be perceived, even with the assistance of a good microscope: having spun out a quantity of cotton-like threads, and discharged several globular drops of saccharine matter, she deposits therein from twelve to twenty oblong eggs, and then dies: the external husk of her body alone remaining, as a shelter for the eggs and young ones. The male insect, I have not yet observed, but it is no doubt a small winged fly, similar to that of other species of this genus.

My Larch Firs alone, were at first infested by this insect, but from some cause or other, which I am unable to solve, it has of late years deserted, in some measure, the Larch, and attached itself to the Weymouth Pine and Silver Fir. Having once exhibited this disposition to change, is it not possible that it may ultimately invade our gardens, and unless its progress be arrested, become as formidable an enemy to plants on the outside of our hot-houses, as the *Coccus adonidum* is to those within?

In any case, this is a subject worthy of consideration, and although its destruction upon a large scale might be difficult

to accomplish, yet the pregnant insects are so tender, that they may be killed with the slightest pressure.

I am, dear Sir,

your obliged, and faithful friend,

OSWALD MOSLEY.

Rolleston Hall, June, 2, 1818.

P. S. Since writing the above, my suspicions of the migratory habits of this Insect have been confirmed; a young Cedar of Libanus, in my garden, has lately suffered from its vicinity to a Weymouth Pine, which has long been infested by it.

XXXVII. *Account of Experiments on the Production of* Blue *instead of* Red Flowers, *on the* Hydrangea Hortensis; *with some Notes on the Propagation and Management of the Plant. By Mr.* William Hedges, *F.H.S. Gardener to the Earl of* Mansfield, *at Kenwood.*

Read July 7, 1818.

Soon after the first introduction of the *Hydrangea Hortensis* from China into our gardens, some plants of it produced flowers of a blue, instead of a red colour. It was at first thought that the plants which thus differed from the original one were a distinct variety; but as neither the same plants, nor those raised from them, continued to produce blue flowers, it was evident that the change was the effect of a peculiar culture, either accidentally or intentionally used.

Being much struck with the beauty of the flowers of the new colour, I became very desirous of producing the change myself, and made trial of the different methods which were recommended for the purpose.

It was at first generally given out, that either common salt, or salt-petre used in small quantities, with ordinary loam, was the cause of the change: these I applied variously, but without success; and I believe it is now well understood, that neither of these ingredients at all contribute, to make the colour of the flowers vary from red to blue.

Plants sent to Covent Garden for some years, by Mr. SMITH of Dalston, and some which were sold by other Gardeners in the vicinity of London, were known to bear very perfect blue flowers; these plants were shifted in the winter from the common compost in which they grew, into bog earth, and the transition was successful in its operation. I accordingly removed plants into pots filled with the bog earth of Hampstead Heath; but to my great mortification, they still retained, when in flower, the original colour. I am, however, assured, that by shifting the plants from loam or compost, into the bog earth used in the nurseries round London, they will blow blue; and I hear that Mr. SMITH still succeeds with this practice.

What I failed to effect by experiment, I at last obtained by accident; a Hydrangea, which I had turned out into a particular border of the shrubbery at Kenwood, produced blue flowers two years successively. The soil which caused the plant thus to change, was a pure pale yellow loam, inclining to a light brick earth, such as is used for Pine-Apple plants, and which is found in abundance on Hampstead Heath, from whence I have since taken it for the same purpose, with equal success; and Mr. MORGAN has informed me, that he has always made his Hydrangeas produce blue flowers, by planting them in similar loam, from a common in the neighbourhood of North Mimms Place in Hertfordshire. I have also lately learned, that, in gardens and shrubberies, where the borders are formed of this sort of loam, the Hydrangeas, which are turned out into them, always blow blue.

Having thus attained my object, I continued to grow my Hydrangeas, some with red, and some with blue flowers,

according as I placed them in garden compost, or in the yellow loam of Hampstead Heath. If a plant whose flowers had been red one year, was shifted into the loam, they became blue; if the plant remained in the loam a second year, the flowers continued to be blue, but if it was returned to the garden compost, whether after one or two years, it resumed the red colour of its flowers. It was conjectured that a superabundance of iron in this loam might cause it to produce this change in the plants, and this conjecture was strengthened by an account, that a small quantity of filings of iron, or steel, mixed in any soil in which Hydrangeas grew, would make them vary the colour of their flowers. To ascertain the accuracy of this account, I last winter planted several Hydrangeas in various soils, into which I put a small quantity of iron filings; others I planted in bog earth, others in garden compost, and some in the Hampstead Heath loam; but I obtained blue flowers from the last only, I therefore place no reliance on the efficacy of steel or iron filings, nor do I suppose that iron can be the agent in the change, since mould which contains as much iron as that of Hampstead Heath is useless for this particular purpose. It cannot be questioned but it is some peculiar quality in the earth, which produces this singular effect; what it is, I have not been able to ascertain; all I can do is to give the results of my experiments, which are, that no adventitious matter, yet named, will effect the change with certainty; that garden mould or compost will invariably keep the flowers red; that some sorts of bog-earth will make the flowers blue, as is the case in the Dalston garden, but that every sort of bog-earth will not; and lastly, that the sort of yellow loam, I have described, will invariably produce the change.

Few plants exceed the Hydrangea Hortensis in beauty, especially if some bearing blue and some red flowers, are mixed together. I have in general been very successful in the management of them, which has been conducted in the following manner.

As a succession of young plants is necessary, I raise some each year by taking, in the beginning or middle of July, young shoots with three or four joints, cutting them off close to the joint which is at the bottom of the shoot; these are planted in rich earth, in a warm border, and covered with a hand-glass; they are shaded during the middle of the day, and sprinkled with water from a fine rose watering pot, two or three times a week, in the evening, so as to keep them moist; the glass being kept close over them at all times. They will also grow by layers made in July, in the same way as is usual with Carnations. The cuttings or layers will be well rooted by the end of August, at which time, or early in September, they must be put singly into small pots, and placed under a frame, which at first must be shut up close; if they can be assisted by a temperate dung heat, at this time, it will be better for them. In the frame they must be shaded and watered as before. About the middle or end of October, they are to be taken into the green house, or other shelter, where they can be protected from wet and frost; during the winter, they must be watered once a week or fortnight, as they may require. In the latter end of May, or early in June following, they must be turned out into a bed of rich mould, in the open ground, to remain there till September, when they must be taken up and potted, and kept protected from damp and cold, as in the preceding winter. Instead of turning them out, as stated,

in the spring, they may be retained in pots; but they must be shifted twice during the summer. By either method fine strong plants will be formed, fit for forcing or turning out in the succeeding spring. If wanted for the borders, let them be put out when all danger of their sustaining injury by frost is over; they will stand the winter in the borders, and will also bear flowers, though not so well as when protected by a house. Those which are to flower in pots, are taken as soon as their buds begin to swell in the spring, all the old mould being removed from their roots, they are planted in fresh earth, in pots of about eight inches diameter at top, and placed in front of the green-house or peach-house; if the plants are not over large, pots of smaller dimensions should be used; these will come into flower in June. Care must be taken to supply them plentifully with water whilst they are coming into bloom, and it is best to place water-pans under the pots, to secure a continual supply of moisture. If it is desired to have plants in flower *early* in the spring, they must be shifted into their new pots in January, and brought foward with forcing heat. The mould I generally give to my Hydrangeas is a compost of loam and bog-earth, or leaf-mould, with a little sand, well incorporated together; in this they will produce red-flowers; if they are expected to blow blue, they must be planted in the pure yellow loam.

XXXVIII. *Observations on, and Account of the Cultivation of, the Tree* Mignonette. *By* Joseph Sabine, *Esq. F.R.S. &c. Secretary.*.

Read July 7th, 1818.

The *Reseda odorata* of Linnæus, so well known as a hardy annual plant in our gardens, under the name of *Mignonette,* is a native of the northern parts of Africa, having been found wild in Egypt and Barbary, from whence it was brought to the south of France. Miller, in the sixth Edition of his *Gardener's Dictionary,* published in 1752, states, that he had it then in cultivation in the Chelsea Garden, having received the seeds from Professor Van Royen, of Leyden; but its introduction into our flower gardens was through the intervention of the late Lord Bateman, who brought it from France soon after the period it was first received by Miller. With Lord Bateman the appellation of Mignonette originated; pleased with the appearance and fragrance of the plant, he gave to it this name of endearment, by which it is not known in France, the writers and gardeners of that country merely calling it *le Reseda odorant.* A representation of it was published in 1758, by Miller, in his *Figures of Plants,* plate 217, who there, as well as in the sixth edition of his Dictionary, calls it *Mignonette d'Egypte;* it has also been more recently figured in the *Botanical Magazine,* plate 29.

It grows freely in the open border, if sown in spring, but does much better if suffered to scatter its own seed in the autumn, on the places destined for its growth; by this means, it is not unusual to see it springing up with great luxuriance in the interstices of the stone pavements of yards in the fronts of houses in towns, which it most agreeably enlivens and perfumes.

Its cultivation in pots, and in winter, has been well detailed by Mr. RISHON, in the *Transactions of the Horticultural Society*.* My object, in introducing it to the notice of this Meeting, is to offer some observations on a variety recently brought to this country, which has the appearance of a dwarf-shrub, and possesses some properties, besides that singularity, which entitle it to the attention of the Gardener.

The *Tree Mignonette* has been supposed to be only the common annual, trained to a single stem, with the support of a stick, to a certain height, and then suffered to shoot and form a head, which it will certainly do; but the plant so trained is very inferior in form, habit, and odour, to the Tree Mignonette. I consider the latter as an established variety, capable of reproducing itself from its own seed. It has been long known on the Continent, and I believe was some years since sent to the Hammersmith Nursery by the late Professor BROUSSONET, but was not preserved there long. We owe its present introduction to Lady WHITSHED, who brought two full-grown plants with her from Liége, in the autumn of 1816, one of which was exhibited at our Anniversary last year. The plant immediately attracted the attention of the Editor of the *Botanical Register*, who soon after published

* See vol. ii. page 374.

(plate 227) a figure of a branch, and an account of its cultivation, which Sir Joseph Banks had obtained from the Abbé Larbaleste, of Liége, the person from whom Lady Whitshed procured her plants. Information which I have subsequently received from M. Vilmorin, from Lady Whitshed, and from Mr. Colvill, of the King's road (who has in the last year propagated it extensively) enables me to add some useful particulars to the notes given in the *Botanical Register*.

The Tree Mignonette is to be propagated from seeds sown in spring; it may also be increased by cuttings, which will readily strike. The young plants should be put singly into small pots, and brought forward by heat, that of a gentle hotbed being preferable, but they will grow well without artificial heat. As they advance, they must be tied to a stick; taking care to prevent the growth of the smaller side shoots, by pinching them off, but allowing the leaves of the main stem to remain on for a time to support and strengthen it. When they have attained the height of about ten inches, or more, according to the fancy of the cultivator, the shoots must be suffered to extend themselves from the top, but must be occasionally stopped at the ends, to force them to form a bushy head, which, by the autumn, will be eight or nine inches in diameter, and covered with bloom. As soon as the head begins to be formed, the leaves on the main stem must be removed. Sometimes flowers will shew themselves at the top of the leading shoot, before it is of the length desired, this head must then be taken off, as far as the flowers shew, and a side shoot trained in continuation of the main stem, like a new leader to a tree which has lost its original

one. Whilst the plants are attaining their proper size, they should be shifted progressively into larger pots, and may ultimately be left in those of about six inches diameter at top. They will require the protection of a green-house, and will continue to bloom through the winter, care being taken, as the flowers decay, to cut away the flowering branches, in order that a succession may be produced, and this operation must be regularly performed, unless it is wished to obtain ripe seeds; by this process, a succession of crops of flowers will be obtained throughout the year. One of the plants which Lady WHITSHED first introduced, bore three sets of flowers between November and the following June, this plant is now four years old, and the stem of it is an inch in circumference. It is generally necessary to keep the full grown plants well watered, and they will, with ordinary care, and protection from damp and frost, last several years, though, as they are easily raised, a succession of young plants is desirable, for such are more productive of good flowers.

There will be some inducement to cultivate this plant on account of its singularity, but the great advantage to be derived from it, is the continuance of its fragrance through the winter, in which particular, at that season, it far excels the common Mignonette under the best management. A single plant in flower will fully perfume any room in which it is kept.

A comparison of the different plants raised from seed in their progress of growth, has convinced me that the Tree Mignonette is distinct, as a variety from the common kind. I have purposely left them in the same situation, and allowed them to grow without control; whilst the common Mignonette

shot out its flowering branches in its usual manner, the Tree Mignonette extended itself flat on the ground (being without support) with long shoots, flowering more freely than the other. The leaves of the common Mignonette are frequently three-lobed, as well as long and broad, in comparison; those of the Tree Mignonette are small, short, and uniformly without lobes, being simply lanceolate; its shoots, though growing in apparent health and vigour, seem to have a tendency to produce more flowers than leaves, and resemble those of the common sort when it grows in a situation where it does not receive much rich nourishment from the soil.

XXXIX. *Account of a Method of ripening* Seeds *in a wet Season; with some Notices of the Cultivation of certain* Vegetables *and* Plants *in China. In a Letter to the* Secretary. *By* John Livingstone, *Esq. Corresponding Member of the Horticultural Society.*

Read July 7, 1818.

Sir,

By the hands of my friend, Mr. Reeves, on his return to China, from England, I had the honour to receive a Copy of the Charter and Bye-Laws of the Horticultural Society of London, together with the information contained in your letter to him, that the Society had been pleased to appoint me one of its Corresponding Members.

In return for this distinguished mark of attention, I shall take much pleasure in contributing my best endeavours to forward the views of the Society. About twenty five years pretty close attention to the Gardens of China, having enabled me to become familiar with its Horticulture, I intended to lay before the Society a general outline of the subject: some unforeseen circumstances have come in the way of the accomplishment of my plan this season, but I hope the few hints which follow, if they contain little either new or important, may, nevertheless, serve to shew my willingness to be useful.

From April to October, rain is so frequent in China, and the air is generally so moist, that it is nearly impossible to

preserve Seeds. If excluded from the air, they are quickly covered with mildew, and when exposed, no less certainly destroyed by insects. It occurred to me, in September last, that air made dry by means of sulphuric acid, might be advantageously employed for this purpose, and the success of the experiments I have made, has been complete. I placed the seeds to be dried, in the pans of LESLIE's ice machine, and carefully replaced the receiver without exhausting the air: small seeds were sufficiently dried in one or two days, and the largest seeds in less than a week.

Where no ice machine is at hand, any glass, glazed earthenware, or leaden vessel may be employed for the same purpose; but it is absolutely necessary that the cover fit exactly, and that the bottom contain at least one inch of concentrated sulphuric acid. The seeds may be placed on any kind of plate supported on a glass stand.

Seeds thus dried, may be afterwards preserved in a vegetating state for any necessary length of time, by keeping them in an airy situation, in common brown paper, and occasionally exposing them to the air, on a fine day, especially after damp weather. This method will succeed with all the larger mucilaginous seeds. Very small seeds, berries, and oily seeds, may probably require to be kept in sugar, or with currants or raisins.

The garden seeds which are sent to China from England, the Cape of Good Hope, New South Wales, or Bengal, frequently fail, or arrive too late; and although the Chinese try every year to raise seeds, their endeavours are very seldom crowned with success. But the gardeners who supply the markets with Cabbages have contrived a method of supplying

themselves with plants, without any danger of failing, and with this advantage, that it enables them to bring their Cabbages to market two or three weeks earlier than can be done by the usual way of producing plants from seeds.

Their method is this: In February or March, they plant closely, in a corner of the ground, a number of Cabbage roots (the Cabbages having been cut a short time before) and for some time they cut off the sprouts, which now frequently form into small heads; but in May and June, the sprouts extend along the ground, as runners, to the distance of several feet, and even yards. In July and August, these runners are covered with young shoots, very much resembling Cabbage-plants without roots; these shoots are slipped off from the runners, planted in beds, covered with a net, and carefully watered. In September, the slips are found to answer in all respects as Cabbage-plants; but Cabbages thus obtained, when full grown in December, are seldom so firm as those raised from seed, and they are also more disposed to shoot.

The Chinese cultivate a great variety of plants, such as Asters, Chrysanthemums, Anthemedes, &c. much in the same manner, and thereby preserve their almost endless varieties, to obtain which, they devote much care and attention.

The young shoots are supplied, by way of root, with a small ball, composed of clay, tempered with water, wood ashes, soot, old mud wall, or sometimes a little old manure. They are kept under the shade of a tree, and carefully watered.

I trust this short communication to the care and good management of our friend Mr. Reeves, and remain,

Sir,

Your very obedient servant,

John Livingstone.

Macao, January, 15, 1818.

XL. *Instructions for the Treatment of the* Amaryllis longifolia, *as a hardy Aquatic, with some Observations on the Production of* Hybrid Plants, *and the Treatment of the Bulbs of the Genera* Crinum *and* Amaryllis. *In a Letter to the* Secretary. *By the Hon. and Rev.* WILLIAM HERBERT, *D. C. L. F. H. S. &c.*

Read July 7, 1818.

DEAR SIR,

HAVING been led, by some circumstances, to suspect that the bulb which is known by the name of *Amaryllis longifolia*, and treated in this country as a tender green-house, or dry stove, plant, (but which belongs, in fact, to the family of *Crinums*, and should properly be called *Crinum Capense*) was, in its native country, an aquatic plant, I determined last year, to ascertain the fact by experiments. On the first of July, I plunged a pot containing one of the plants, in a cistern, on a flue, in the hot-house, together with some Nympheas, placing the Crinum two or three inches deeper than the Nympheas, in the water. At the same time I plunged another in a cistern, in a cooler part of the stove, near the front light. The result was such as I had expected: in a very few days the plants began to shoot more vigorously, and fresh young fibres to appear in the water on the surface of the earth. The plants continued, during the whole summer, to improve in appearance, and the fibres grew out of the bottom of the pot to a considera-

able length in the water. Having thus ascertained that the species was, as I had suspected, an aquatic plant, I proceeded to try whether it would endure an English winter, under the protection of the water, in a pond in the garden. About the middle of September, I plunged the pot which had been in the warmest cistern about two feet below the surface of the water in the pond. On the last night of September, a severe frost, which very much injured the green-house plants that were still remaining in the open air, and killed many of the Geraniums, cut the leaves of the Crinum to the surface of the water, but no lower. During the winter, the water moss gathered round the pot, so that I lost sight of the plant; and the ice was occasionally about three inches thick. On the tenth of April, the moss having risen to the surface, and the water become more transparent, I had the pleasure of observing that the plant was alive, apparently in good health, and that the leaves which had died back to within a few inches of the neck of the bulb were evidently growing again. The pot was then taken out of the pond, and (on turning the plant out) it appeared to be completely matted with white fibres, in the most healthy and vigorous state, and there was not the least appearance of decay about the bulb or stem. The plant was in better condition than those which had been kept in the green-house. As it perceived the change of temperature at that depth, and began to grow so early as the commencement of April, I have very little doubt of its flowering in the same situation: and I think it will flower as a hardy aquatic if planted in any pond or river of two feet water, not liable to freeze at the bottom. The bulb, which was a seedling, grown to about half

the full size, was planted immediately in a larger pot, which raised it about six inches higher in the water, and was replaced in the pond: an old bulb, which had passed the winter in the green-house, was put by its side. They are both thriving well, and their leaves are half a yard above the water. Towards the latter end of May, I placed in the pond a pot with another old plant, so that the pot and the surface of the earth that covers the bulb are about an inch under the water. It had not been long there before a flower bud appeared; and it has at this moment two vigorous and tall flower stems, which stand erect, without any support, and resist the wind (which has been pretty strong, and has torn many of the herbaceous plants) in a manner that they would not have had strength to do under the usual treatment. The flowers are unusually fine, and highly coloured. Perhaps it may be well to raise the pots, in the spring, nearly to the surface of the water, but I have very little doubt of the plants flowering, even in their winter situation, a little later in the summer; at all events, this beautiful plant may be generally removed from the stove or green-house, to take its place beside the hardy Nympheas in the water.

I have at this moment in fine blossom, a beautiful new species of hybrid Crinum, which was raised in the autumn of 1813, from the seed of the Crinum Capense (or Amaryllis longifolia), which had been impregnated in Lord Carnarvon's hot-house, by the skilful management of Mr. Gowen, with the pollen of the Crinum Moluccanum of Dr. Roxburg; an Amboyna plant, which is figured in the *Botanical Magazine*, plate 1171, under the name of Amaryllis ornata, and which has since been confounded by Mr. Ker, in his review of the

genus Amaryllis,* with the Amaryllis Zeylanica, of LINNÆUS, and Crinum Zeylanicum of the *Calcutta Catalogue.* Crinum Zeylanicum is a plant of difficult culture,† which Mr. KER has probably never seen, lately introduced into this country, and very distinct from Crinum Moluccanum. Twenty-four mule seeds were produced in one capsule; the young plants are all exactly like each other, and differ in the same points from the parents, and I am confident that the same botanical distinctions will be perpetuated in the seedlings that may be raised from them. A new species of Crinum, superior in beauty to any other of equal hardiness, and not much inferior to the magnificent Crinum amabile, has been thus created in the same manner in which the distinct species of many genera of plants have been produced in the course of time, by the accidental operations of nature. I sent one of these bulbs, last year, to Calcutta, under the name of *Crinum Govenium hybridum*, which should be mentioned, because its offspring may perhaps hereafter be sent as an eastern production to this country. I have raised several other curious mule plants, and I have uniformly found that the mule seeds which lay in the same capsule produce plants which have the same botanical distinctions from their parents. On this subject I shall perhaps address you again hereafter. Crinum Govenium hybri-

* See Journal of Science and the Arts, vol. iii. p. 102.

† The leaves of Crinum Zeylanicum flag and wither if exposed to the sun, even when the bulb is immersed in the water of a pond out of doors. It is therefore very difficult to find a suitable situation for it in the stove. The same difficulty attends the culture of Pancratium biflorum. I suppose them to be both natives of deep shades, where, although the temperature is high, the sun beams cannot penetrate. Pancratium biflorum and triflorum are now considered at Calcutta to be one species.

dum differs from Crinum Capense, (otherwise called Amaryllis longifolia,) in having leaves of a lively light green, which in the mother plant, are glaucous; quite erect, unless broken down by wind or accident; instead of being flexible, tortuous, and hanging like the lash of a whip; furnished with a strong prominent, whitish midrib, instead of having a smooth convex surface on the back. The flowers have no peduncle, whereas the mother plant, when in vigour, has peduncles an inch and half, and upwards, in length; generally from an inch to an inch and half long. In the mother plant, the tube is longer than the limb; in the Crinum Govenium the limb is considerably longer than the tube. The limb also expands wider, and the tube is shorter than in the mother plant. The colours are paler than those of Crinum Moluccanum, and are much more distinct than those of Crinum Capense. The ground is clear white, with a stripe on each segment of purplish lake colour, vivid in the bud, and fading to pink, as the flower advances. The flowers, which in the mother plant are successive, and hang diversely, are closer and more erect, blow out nearer the same time, and form a magnificent truss. The scent is likewise different. The stem has now eleven buds, of which, all but three are expanded, and none compleately faded. The plant is of larger stature than either parent; the leaves stand erect, about five feet high; the scape about a yard. I have placed one of these plants lately in the pond, where it is thriving; and although it appears, in consequence of its affinity to Crinum Moluccanum, to be more tender than the Cape parent; I think it will be found capable of living either in the green-house, or in the pond out of doors. Most of the Crinums are swamp plants, or

grow in river mud, and should be cultivated in our stoves with a pan of water under them, the bulbs being raised above the earth, and stripped of all dead integuments, but those of Crinum Capense, being hardier and liable to bleed, thrive best under ground.

I am, Dear Sir,
Your most obedient humble Servant,
WILLIAM HERBERT.

Spofforth, July 1, 1818.

Postscript, September 2, 1818.

The bulb of *Crinum Capense,* or *Amaryllis longifolia,* which had been put into the pond in April, the top of the pot being a foot and a half, or more, under water, pushed a vigorous flower stem, two or three days after the date of my letter, which advanced with such rapidity that the spathe on the 9th of July stood as high above the water as that of the bulb which was immediately under its surface. It appears, therefore, that the depth of water necessary to protect the bulbs in the winter will not delay the flowering much more than a week, if at all. The bulbs continued flowering till the middle of August, the first having sent up three, the second two successive stems. Another root, which, though not in the pond, was kept extremely wet, produced four stems between the 1st of May and the 20th of July. All the plants have perfected their seed. Some of the pods have attained the size of an apple, about seven inches in circumference, bending the peduncles completely down by their weight, while the stem continues erect. They contained from nine to near sixty seeds, varying in size from that of a small wal-

nut to that of a very small pea, but some even of the smallest have already vegetated.

Immediately after the flowers of the hybrid Crinum had faded, I placed the pot in the pond, about two inches under the surface of the water. After it had stood there about a fortnight, a second flower-stem made its appearance, stronger and more highly coloured than that which had been produced in the stove. It bore twelve flower-buds, the first of which expanded on the 27th of July, and the whole inflorescence was sent a few days after, by your desire, to the Horticultural Society. I have also kept in the pond, for two months, advantageously, the Asiatic Crinum longifolium, of Dr. ROXBURG, the leaves of which blister and burst in the stove, with a discharge of thick juice, whenever the sun is very powerful. It is a solitary bulb, rarely, if ever, producing an offset, and flowers with a reclining scape in the meadows of Bengal at the time of their inundation.

I keep the Crinum Asiaticum of Dr. ROXBURG, which is Mr. KER's Crinum defixum, plunged in water, or with a pan under it, in the stove, where it flowered strong in July. It is a native of the ditches that communicate with the water of the rivers in Bengal, where it roots deeply in the mud, on which account (as the name Asiaticum, which it bears at Calcutta, had been given in Europe to a very different plant) it is called by Mr. KER, defixum; but the idea of its having a tap root, originating from a drawing by Dr. ROXBURG, which I have not seen, is quite erroneous. It increases like Pancratium rotatum, by stolones, that descend into the mud, and if there be a strong fibre in his drawing that has been mistaken for a tap root, it must be either one

of these stolones attached to the bulb, or an accidentally vigorous fibre belonging, perhaps, to a seedling bulb; for seedling Pancratiums, Crinums, Ixias, Gladioluses, and small Oxalis bulbs, frequently send down a very vigorous fleshy fibre of extraordinary thickness, that supports the rapid increase of the young bulb. Of course, when the bulbs of Crinum defixum have sunk deep in the loose mud, there must be a great prolongation of the neck of the bulb, or rather of the lower part of the leaves, before they can diverge, but this is merely owing to the depth at which the bulbs are set. In cultivation, the bulb of Crinum defixum, when kept above ground, is round, and of a bright green: in its habits and general appearance, the plant resembles extremely Pancratium rotatum, for which a superficial observer might easily mistake it. I think it likely to thrive in the summer months in the open pond, and perhaps to flower there if wintered in the stove. Amaryllis Atamasco is likewise a swamp plant, and flowers and ripens its seed freely if the pot is kept standing in water.

It should be observed, that the plant with erect green leaves, and flowers that have no peduncles, which has been lately figured in the ***Botanical Register***, Plate 303, as a long flowered variety of Amaryllis longifolia, is not included under the foregoing directions for the culture of Amaryllis longifolia, being a tropical plant that requires much stronger heat and less water, and, in my opinion, a very distinct species. There is however a bulb from the Cape, with leaves of a bright green, but tortuous, like those of the common glaucous longifolia, which will thrive under the same treatment, and is probably only a variety of that species,

though I have not yet seen its flower, which has not been described in any publication.

I may take this opportunity of mentioning that the Crinum augustum of the *Calcutta Catalogue*, which has been supposed to be an unknown species, has proved, by its flower in this country, to be the same plant as Sir Abraham Hume's Crinum named amabile in the *Botanical Magazine*, Plate 1605; and that it is now well known at Calcutta to be so. There are seven species of Crinum from the northern coast of New Holland, at present in cultivation at Calcutta, where they have not, however, as yet yielded any increase. Of these, I believe, only two have been described, and that very imperfectly.

I have just raised from seed, mules from Crinum Capense (Amaryllis longifolia), impregnated by Crinum erubescens, and also from Crinum Capense, impregnated by a splendid crimson and white species of Amaryllioid Crinum with broad petals, which being, I believe, unrecorded, I have named *scaberrimum*, on account of the very rough margin of its leaf. It is very remarkable, that the radical shooting from the seed of this Crinum scaberrimum is at first woolly, and that the radicle of the seeds of Capense impregnated with its pollen have proved woolly also, though that of the other seeds produced from it are quite smooth. I continue to find, invariably, the mule seedlings, from a similar impregnation, alike amongst themselves; and to distinguish the origin of the many new species of plants so created, I propose to call each by the name of its female parent, with that of the male prefixed in the ablative. I should therefore call the hybrid Crinum Govenium, of which you have received a specimen, Crinum Mo-

luccano-Capense; and the two new species which are just raised, Crinum Erubescente-Capense, and Scaberrimo-Capense. A mule which I have succeeded in obtaining from an impregnation of Crinum-Capense with the pollen of Pancratium distichum, I propose to call Prancratio-Crinum Distichо-Capense. In the same manner having raised two beautiful and hardy species of Gladiolus, by impregnating Cardinalis with Blandus, and Blandus with Cardinalis, (of both which I will send bulbs hereafter to the Horticultural Society,) I propose to call one Gladiolus Blando-Cardinalis, and the other Gladiolus Cardinali-Blandus. These two new species of Gladiolus which have flowered make seed freely. I have also mules from Gladiolus tristis, impregnated by the large flowering blue Gladiolus recurvus of the *Botanical Magazine,* plate 578, which have the spotted stem of the male parent, but have not yet shewn their blossom.

Considering the wide field that is open for the creation of new species of plants, by hybrid intermixture, some mode of naming them must be adopted, or the art of cultivators will break down all the landmarks of the botanist. With the means that I now possess, I have little doubt of being able to enrich my collection with as splendid additions by art as by importation. I have several mule Amaryllises, from which I have great expectations, and the new Heaths I have already obtained, are most distinct and remarkable, the individuals of each new species being perfectly uniform.

XLI. *Substance of a Memoir on the Cultivation and Variation of* Brussels Sprouts. *By* Jean Baptiste Van Mons, *M. D. Professor of Chemistry and Rural Economy in the University of Louvain, Foreign Member of the Horticultural Society.*

Read July 7, 1818.

The opinion entertained by the French writers on Horticulture, as well as by the German gardeners, that the *Brussels Sprouts* are only fit for the table after they have been exposed to frost, is erroneous. By proper attention, and management, in Belgium, we contrive to supply ourselves with this delicious vegetable full ten months in the year, that is, from the end of July to the end of May.

To obtain the first crops, the seed is sown in spring, under a frame, so as to bring the plants forward; they are then transplanted into an open border with a good aspect. By late and successive sowings, the supply is continued through the period I have stated.

We usually cut off the top of the plant, about 10 or 15 days before we intend to gather from the stem, which then produces most abundantly, so much so, that if this vegetable be compared with any other, which occupies as little space, lasts as long, and grows as well in situations generally considered unfavourable, such as between rows of Potatoes,

Scarlet Runners, or amongst young trees, it must be considered superior in utility to most others.

The plants in my garden grow to the height of four feet without their tops, and are covered with sprouts from the root upwards. The top is sometimes left on till the spring, and is then gathered for use ; it is very delicate when dressed, and different in flavour from the sprouts. I do not think the produce of sprouts is at all affected by the removal of the head. The plants resist the severest cold, and the only effect, apparently, produced by frost upon them is, that the leaves of the shoots close themselves more together, and become more compact. The small Cabbages thus formed are never, with us, more than half an inch in diameter, they would not be esteemed if they were larger. In the spring, when the shoots are disposed to run to flower, we check their growth by taking up the plants and laying them in the ground, in any shaded spot.

Besides the usual mode of dressing them, the sprouts are sometimes served at table with a sauce composed of vinegar, butter, and nutmeg, poured upon them hot, after they have been boiled.

The seeds are saved indiscriminately from the plants which have been topped, or from those on which the tops have remained ; but I intend in future to collect my seeds solely from the tops, which practice has, I suspect, not been general, only because the tops are so frequently cut for the table in the spring, before they run to flower.

We have no information of the origin of this vegetabl e, but it has been a very old inhabitant of our gardens, for it

is mentioned in our Regulations for holding the Market, in 1213, under the name of *Spruyten* (Sprouts), which it bears to this day.

Much has been said of the disposition of this plant to degenerate; in the soil of Brussels it remains true, and I have lately observed it to do the same at Louvain; but at Malines, which is the same distance from Brussels as Louvain, and where the greatest attention is paid to the growth of vegetables, it deviates from its proper character, after the first sowing; yet it does not seem that any particular soil or aspect is essential to the plant, for it grows equally well and true at Brussels, in the gardens of the town, where the soil is sandy, and mixed with a black moist loam, as in the fields, where a compact white clay predominates.

The progress of deterioration at Malines was most rapid; the plants raised from seed of the true sort, which I had sent there, produced the Sprouts in little bunches, or rosettes in their true form; seeds of those being saved, they gave plants in which the Sprouts did not form into little Cabbages, but were expanded; nor did they shoot again at the axils of the stem. The plants raised from the seeds of these last mentioned, only produced lateral shoots with weak pendant leaves, and tops similar to the shoots, so that in three generations, the entire character of the original was lost.

From a plant in the state last described, seed was saved, at my request, and sent back to me. I had it sown by itself, and carefully watched the plants in their growth; I was not long in discovering that they retained the same character of degeneration they had assumed at Malines, and preserved it throughout the whole course of their growth, yielding pen-

dulous leaves, with long peduncles, and having no disposition to cabbage. I suffered these plants to run to seed at a great distance from my true Sprouts, which the extent of my garden allowed me easily to do. The second sowing brought them back a good deal, to their true character, the plants yielded small Cabbages regularly at each axil, but not generally full or compact, and they did not shoot a second time, as the true sort does. I again suffered these to run to seed, using the same precaution of keeping them by themselves. I sowed the seed, and this time the plants were found to have entirely recovered their original habits, their head, and rich produce; and in the next year's sowing, the seed will be mixed with that of my select plants. It is a sort of lost child, for whom absence has doubled my affection.

XLII. *Notes on, and Description of, Varieties of the* Magnolia glauca. *By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read August 4, 1818.

Varieties of the *Magnolia glauca* have fallen under my observation this summer, which are but little known, and as they are particularly desirable plants in the garden and shrubbery, I hope this notice of them may be acceptable to the Horticultural Society.

The authors who have given descriptions of the Magnolia glauca, in its native state, do not record its disposition to vary, further than that they mention that some plants retain their leaves longer than others. Two varieties are noticed, in the *Hortus Kewensis*, the deciduous and the evergreen. To these two, the only ones of which I find printed accounts, I have now to add descriptions of three others.

The original plant grows abundantly in swampy places, in the middle and southern provinces of the United States, and is called the White or Sweet Bay, Swamp Laurel, Beaver Wood, Swamp Sassafras, and small Magnolia. Michaux, in his *Histoire des Arbres Fruitiers de l'Amérique Septentrionale*, Vol. iii. page 77, has given a tolerable plate, and a very good account of the plant; but neither it, nor any of its varieties, has been figured in any other recent Botanical work.

The *Magnolia glauca latifolia,* or *Deciduous Swamp Magnolia,* of the *Hortus Kewensis,* is so well known, that it is not necessary to be particular in the description of it, were it not that the other varieties of it will be more readily known by comparison with the following notes relative to it. Its leaves are, in general, about four inches and a half in length, and two inches and a half in breadth, of a bright shining green above, and covered below with a silvery bloom, giving the plant a very glaucous appearance, and affording a fine contrast to the colour of the upper surface of the leaves. The flowers appear at the end of June, and continue through July, on the extremity of the preceding year's shoots; the flower buds are covered with a spathe (which has not been generally noticed or described by authors) that falls off before the flower opens, leaving a marked ring on the peduncle, at a short distance from the flower. The calyx consists of three ovate leaves, of very thin substance, which is green at first, and afterwards becomes whitish; they are rather concave when open, are not reflected, and soon decay. The flowers are at first white, or rather of a rich cream colour, acquiring gradually a pale apricot hue, passing into a light brown, in which state of colour they decay. There are generally eight or nine petals, near an inch and a half long, in each flower; the three outer petals envelop ethe others, before the flower expands; these are very concave, and quite round at the top, contracting towards their lower extremity, but preserving broad bases at their insertion in the recptacle; the interior petals are narrower, each being progressively smaller than the one outside of it; sometimes a few rudiments of more petals exist in the centre. The flower

expands well, but does not open flat, and has a delightful fruit-like scent.

The second variety is the ***Magnolia glauca longifolia,*** or ***Evergreen Swamp Magnolia*** of the ***Hortus Kewensis.*** This Mr. Pursh, in his ***Flora of North America,*** states to be a native of the more southern parts of the United States, and he seems to think it should be considered a distinct species. The leaves are narrower and longer than the first variety, being generally about five inches long, and an inch and a half wide; the branches are more slender, and the tree is altogether not so robust in its habit, as the other. The flowers are smaller, come out late, and are not abundant. The petals are narrower, and less numerous; the flower is not so much cupped, but more expanded. From the shape of its leaves, and its habit, the plant is more elegant in its general appearance. Though it is called evergreen, it certainly has not a legitimate claim to be considered as such, for its leaves are not permanent on the branches during winter, but only remain attached longer than is usual in deciduous trees.

Gordon's ***Double Swamp Magnolia*** is the third variety. In its growth and habit, it much resembles the first mentioned plant. The leaves are a little broader, and the flower is larger, longer, and less globular in shape. The calyx leaves are not so oval, are longer, and being not quite so thin, have the appearance of regular petals, thus apparently adding to the character of doubleness. The position and proportion of the petals to each other are as in the first plant, but they are more numerous, extending to twelve or fourteen in number, and in many cases, I have found eighteen in one

flower; the three outer petals envelope the others before the flower opens, and the whole expands well in warm seasons, and has a very delicious scent. The colour of the petals is not of so clear a white as the former, being at first more tinged with the apricot or light brown hue. This tree I observed in the Nursery garden of Mr. Thompson, at Mile End, where it was planted together with several of the two preceding varieties, (and an abundance of curious exotic trees and shrubs, which are now in the highest state of beauty and perfection), by the late Mr. James Gordon, between sixty and seventy years ago.

The fourth variety was pointed out to me by Mr. Milne, in the Garden of Messrs. Whitley, Brames, and Milne, at Fulham. It was left there by their predecessor, Mr. Burchell, who obtained it from America; but whether as a young plant, or by means of imported seed, is not remembered. The plant being a stool in the Nursery, does not shew its natural habit; but as its shoots are very vigorous, I conclude it is more free in its growth than the common sort. The leaves, on an average, are nearly six inches long, and three inches wide, much exceeding those of the common sort in magnitude; in other points, they exactly correspond. The flowers are very fragrant, but do not open freely; the petals have the appearance of being crumpled together, they are nearly two inches and a half long. The flower bud is thick, pointed, and hard to the touch, and besides the calyx leaves, which greatly resemble petals, consists of about twelve regular petals. It is very probable, should this plant be placed in a situation suitable to it, that its flowers would expand well, in which case its large leaves and superior scent would

entitle it to a decided preference. It should, I think, for distinction's sake, be called BURCHELL'S *Double Swamp Magnolia.*

The fifth variety is quite new. It was raised from seed gathered from an old tree of the first described plant, in the Garden of Mr. THOMPSON, of Mile End, in 1808, in which year the Magnolias flowered and ripened their seeds in perfection. In the seed bed, one plant was observed with peculiarly large leaves, and of vigorous growth, and was consequently separated from the others, and treated with attention. It blossomed, for the first time, four years ago, and as the size of the flowers is correspondent with the magnitude of the other parts of the tree, it seems highly deserving of cultivation. Young plants were early raised by layers, from the original, and one of them, which is now five years old, is near ten feet high. The shoots are very strong, and the leaves, on an average, are about nine inches long, and four inches broad, otherwise corresponding exactly with those of the common deciduous variety, except that they are a little less glaucous underneath. The flowers opened this year about the middle of June; the calyx leaves are long and narrow, thin in substance, of a greenish white colour, slightly tinged on the back with red, and expanding separately from the petals: the three exterior petals are very large, being about three inches and a half long by two inches broad, of a thick fleshy substance, enclosing the other parts of the flower; they are not so concave as in any of the other varieties, being nearly flat when the flower is open; the interior petals are usually five, of the same length as the others, but narrower; the flower opens well, shewing all the petals dis-

tinct, and separate, it is of the same colour as those of the plant from whence it originated, and goes off brown, in like manner. The scent, at first opening, is equally delicious; but, as the flower decays, becomes less pleasant. I presume this will receive the name of THOMPSON'S *Swamp Magnolia,* to record its origin. From the superior size of the leaves and flowers, it has been conjectured that this plant is a hybrid production between the Magnolia glauca and Magnolia tripetala, and as a tree of the latter grows close to that from which the seed of the new plant was obtained, if hybrid productions in plants are ever effected without artificial assistance, this may be one of those deviations from the ordinary course of nature. There are certainly parts of the plant which resemble the Magnolia tripetala, but not, as appears to me, sufficiently to sanction the conjecture. I consider these only as strong variations of the original plant, the effect of a disposition to enlarge itself in all its parts.

XLIII. *Upon the Variations of the Scarlet Strawberry* (Fragaria Virginiana) *when Propagated by Seeds. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read August 4, 1818.

The gardens of Europe, in the opinion of our most eminent botanists, have been indebted to America, for three distinct species of esculent *Strawberry:* the Grandiflora, or Pine; the Chiloensis, or Chili; and the Virginiana, or common Scarlet; the first being supposed to be a native of Surinam, the second of Chili, and the third of Virginia; and the external characters of the different kinds are as marked as those of the congeners of other genera usually are. Nevertheless, I believe all to be varieties only of one species; for all may be made to breed together indiscriminately, and I have found that similar varieties may be obtained from the seeds of any of them: and upon the same evidence, I consider the wild Strawberry of Canada (supposed to have been introduced by his Royal Highness the Duke of Kent), the Bath Scarlet and the Black, and in short, all our large Strawberries, with the exception of the Hautbois, to be varieties of the same plant.

The experiments requisite to ascertain the facts above stated, necessarily occasioned the production of an immense family of new varieties, of which my garden at present contains not less than 400; some very bad, but the greater part tolerably good, and a few, I think, very excellent. I have

sent a few runners of those varieties which appeared to me most deserving of culture, with a request that they may be placed in the garden of the Horticultural Society. I have numbered each variety, and will add an account of the parentage, and as accurate a description of each, as circumstances will enable me to give; but all the varieties I send, sprang from seeds in the spring of 1817, and of course produced their first fruit in the present year.

No. 2. Produced from a seed of the White Chili and pollen of the Black Strawberry. The foliage and runners of the plant are small, and its whole habit led me to expect the fruit to be small also; but it proved the largest I ever saw; one of the berries having weighed 274 grains. The colour of the fruit was scarlet, the form conic, and not at all flattened or deformed; and its taste and flavour were good, though not such as would have induced me to send plants of it, if the fruit had not been so unusually large.

No. 3. Obtained from a seed of the Pine and pollen of the Black Strawberry: its form is conic and long, like that of the Alpine, and I have reason to believe that it will prove a very productive and good variety. The fruit, in the present season, exceeded the size of the Pine in my garden.

No. 4. This sprang from a seed of the White Chili and pollen of the Black Strawberry. It retains the colour and form of its female parent, to which it is inferior in weight; but it was in the last (its first) season, much the sweetest Strawberry I ever tasted; and I thought it the best. I had also several opportunities of subjecting its merits to the opinion of other persons, all of whom, without receiving any leading questions, pronounced it most excellent. How far it

will retain its qualities in a different soil, and less favourable season, I am, of course, ignorant; but, I believe, I can be responsible that it will prove a good and productive variety.

No. 7. A variety which much resembles the Hautbois in form, and in some degree in colour; but it is more red externally, and its pulp is scarlet. The original plant bore a most abundant crop of fine fruit, which ripened rather late.

No. 8. Of the same parentage as Number 4; colour, dark brownish red; very sweet and rich, of peculiar taste and flavour. The fruit is very large, comparatively with the growth and character of the plant, which produced an abundant crop.

No. 10. Very similar in form and size to the common Scarlet, but of darker colour, and ripening much later. The year-old seedling plant produced 113 marketable fruit in the present year. I believe it will prove, in every respect, an excellent variety, its fruit having been, in the present year, very rich and high flavoured. It sprang from a seed of a large and late variety of the Scarlet, and pollen of the Black Strawberry.

No. 13. A very large variety, similar in colour and form to the Black, and in character like the Pine, but somewhat longer; and in the present (its first) season exceeding the Pine in size. Its juice is nearly as deeply coloured as that of a ripe Mulberry; and its external colour appears likely to render it a favourite in the market of London. It is a good and, I believe, it will prove a productive variety, but the plant scarcely emits any runners; the two I send being all I have hitherto been able to obtain from it. It sprang from a seed of the Pine, and pollen of the Black Strawberry.

Nos. 14, 16, 17, and 18, sprang from seeds of the Scarlet, and pollen of the Black Strawberry. All appear to be remarkably productive varieties, and the fruit of all was excellent in the present year. The flesh of No. 16 is remarkable for its deep scarlet colour.

I have two very late varieties, one so late that some of its fruit still remains immature, and none of it was ripe enough to be gathered before the end of the last week. The fruit of both was very large, but the flavour of neither is sufficiently good to induce me to send plants.

I possess at present only a single bearing plant of each of the above mentioned varieties; but should the fruit of any be found valuable, I shall be prepared to send a very large number of plants of all, except No. 13, in the next year; and such will be much at the service of every Member of the Horticultural Society, who may wish to obtain them.

XLIV. *Description and Account of a New* Early Black Cherry. *In a Letter to the* Secretary. *By* Thomas Andrew Knight, *F. R. S. &c. President.*

Read August 4, 1818.

My Dear Sir,

I have sent, according to your desire, some branches of the tree, which produced the *Early Black Cherries,* that were shewn at the last Meeting of the Horticultural Society. It is a variety of which I know but very little, the original tree being but eight years old, and it having been trained, till five years old, (when it produced its first fruit,) to a north wall. Three years ago it was removed to a south-east wall, upon which the fruit you received from me grew; and upon this, its fruit has ripened at least nine days earlier than that of a May Duke Cherry tree, which grows near it, upon the same aspect; but it does not like the May Duke Cherry, possess the merit of being eatable as soon as its colour begins to change. The tree bore a moderately good crop in the last, and a very good one in the present year; and, as it grows older, I have reason to believe that it will be very productive, of blossom at least.

The earliness and beauty of the fruit are, in my estimation, its chief merits; but several of my guests, in the present and last year, thought much more favourably of it; and

their opinions induced me to address a sample of the fruit to you. I, however, do not think it very inferior to the Black Tartarian Cherry, which many think a fine variety.

The parentage of the Early Black Cherry is the same as that of the Black Eagle and Waterloo Cherries; and it so nearly resembles the last mentioned in form, size, and colour, that I do not readily distinguish the one from the other by their external character, except by the longer fruit stalk of the Waterloo Cherry.

I am,
My dear Sir,
sincerely yours,
THOMAS ANDREW KNIGHT.

Note by the Secretary.

The samples of Mr. KNIGHT'S *Early Black Cherry*, of which he has given an account in the above Letter, were tasted at the Meetings of the Society, in the last and present year. Those last sent were much superior to the first specimens, both in appearance and flavour; its further improvement, as the tree becomes older, is to be expected. The flesh is quite soft, but not very juicy; the flavour is pleasant and abundantly sweet, though not very rich. It will prove a valuable addition to the dessert, since we have no Cherry of its character or colour, possessing the property of early maturity; in consequence of which, as it precedes even our

well known May Duke, it will become an acquisition to the market gardener.

The external appearance of this Cherry is so much like that of the Waterloo, already figured in these *Transactions*, (vol. i. page 302,) that the Council has deemed a figure of this new variety unnecessary.

XLV. *Description of a New Seedling* Plum. *In a Letter to the* Secretary. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read September 1, 1818

My Dear Sir,

I have sent you a single specimen of a new variety of *Plum,* which I this season first obtained in a mature state, from a young seedling tree. The appearance of the fruit is, I think, rather inviting; but I have not had any opportunity of judging of its merits or defects; the tree having produced its first fruit in the last year, when it was destroyed, long before it became ripe, by myriads of famishing wasps, and in the present season, the single Plum I send is all I possess. This variety is the offspring of an unsuccessful attempt to combine the bulk of the Yellow Magnum Bonum with the richness and flavour of the Green Gage; the first mentioned, which it resembles in form, and in some degree in colour, having been its male parent. The fruit has ripened ten or twelve days before the Green Gage, on the same aspect, at which period no variety of much merit is, I believe, found, at present, in our gardens.

The experiment not having been made under very favourable circumstances, and the foliage and general habit

of the seedling tree not having been such as induced me to expect that it would produce fruit of much value, I employed it as a stock to support another variety upon a west wall, reserving only a small branch of it to shew its natural produce; or I should probably have had an abundant crop in the present year, as the very few blossoms, which the tree has produced upon the reserved branch, have set well, consistently with some existing circumstances, which were very unfavourable. For I had inserted buds of a Sloe, or wild Plum tree, in the reserved branch; and by the early habit and luxuriant growth of these, the blossoms were at the same time starved and shaded; and the blossoms first produced by young seedling Plum trees, usually set very ill, even under the most favourable external circumstances.

I am,

My dear Sir,

sincerely yours,

Downton, August 28, 1811. THOMAS ANDREW KNIGHT.

Note by the Secretary.

The Plum mentioned in this Paper was tasted at the General Meeting of the Society on the first of September, and was much approved. It seemed in shape, colour, and taste, to have partaken of the qualities and properties of both its parents. It was more oval than round, narrowest at the end next the stalk, with the cleft scarcely percepti-

ble, and rather less than two inches in length. The colour was a warm yellow, mottled with a still deeper yellow, and covered with a light gray or purplish meal. The flesh was a deep yellow, melting, richly sugared, and sufficiently juicy, though not watery.

XLVI. *Observations on, and Account of, the Species and Varieties, of the Genus* Dahlia; *with Instructions for their Cultivation and Treatment By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read October 6, 1818.

No plants, introduced into this country, within my recollection, have excited so much attention, as the *Dahlias;* nor is this to be wondered at; for, independently of the great beauty and diversity of the flowers, they are in perfection at a season when, till they came into notice, our gardens had but little ornament.

It must, however, be acknowledged, that the merit of first carefully attending to, and cultivating these plants, belongs exclusively to the continental gardeners; for though we received them, originally, almost as soon as the French and Germans, yet, if not lost, they had nearly gone out of notice, with us; whilst, in France and Germany, they had increased as much in number, as in beauty: and persons fond of gardening, who visited the continent, on the return of peace, in 1814, were surprised with the splendour and varieties of the Dahlias in the foreign collections. In the winter of that year, several roots were imported into this country, and since that period we have made up for former neglect, as is sufficiently evinced by the splendid exhibitions of these flowers, both in the public and private gardens around London. We have now acquired a more perfect knowledge of their treatment, and new varieties, in abundance,

have been produced here; but, extraordinary as have been the exertions made during the last four years to cultivate and increase them in the London nurseries, they have not been equal to the demand.

The Council of the Horticultural Society having, in May, 1817, announced their wish for "Descriptions of the most excellent varieties of Dahlias, with instructions for the proper cultivation of them," I was in expectation that some of our practical Horticulturists would have favoured us with communications on the subject; but as none has yet appeared, I have been induced to prepare the present Essay, in which, I have endeavoured to give a general view, of all that has hitherto been published on the subject, with such additions, as my own observations, and the communications of friends at home, and correspondents abroad, have supplied me with; amongst the latter, I have the good fortune to enumerate the Count LELIEUR, and M. OTTO, two of the most successful cultivators of the Dahlias on the Continent.

The publications which have hitherto appeared on the Dahlias, are the following: 1st, CAVANILLES *Icones Plantarum quæ, &c. in Hortis* (Hispaniæ) *hospitantur*, printed at Madrid in 1791, and subsequent years. 2d. *Mémoire sur la culture des Dahlias*, &c. par Mons. THOUIN, in the third volume of the *Annales du Museum*, published at Paris, in 1804. 3d. *A Communication from Mr.* BUONAIUTI, *Librarian* (incorrectly styled Gardener) to LORD HOLLAND, *on the Dahlias*, printed at the end of MACDONALD'S *Gardener's Dictionary*: this appears to have been written about July, 1806. 4th. *Observations on the different species of Dahlia*, &c. by Mr. SALISBURY, read April, 1808, before the

Horticultural Society. 5th. *Observations on the culture of the Dahlia in the northern parts of Great Britain,* by Mr. WEDGWOOD, read before the Horticultural Society in November, 1808, and published together with the preceding, in the first volume of the *Society's Transactions.* 6th. The Dahlias are described and noticed by Professor WILLDENOW, of Berlin, in his *Enumeratio Plantarum Horti Regii Botanici Berolinensis,* printed at Berlin, in 1809; and in this he refers to the plates and descriptions of his *Hortus Berolinensis,* in which they had been figured a short time before, and to his edition of the *Species Plantarum* of LINNÆUS. 7th. *Note sur les Georgina* (Dahlia) by Mons. DE CANDOLLE, in the 15th volume of the *Annales du Muséum,* printed in 1810. 8th. Instructions for the cultivation of the Dahlias, in France, are given by Mons. DUMONT DE COURSET, in *Le Botaniste Cultivateur.* 9th. Figures of different varieties of the Dahlias, with some observations on each, have, at various times, been published in the *Paradisus Londinensis,* the *Botanist's Repository,* the *Botanical Magazine,* and the *Botanical Register,* to all of which I shall have occasion, hereafter, more particularly to refer.

The Genus, as is stated in several of the above works, was named in honour of DAHL, a Swedish botanist; some objections were at first made to this name, under an erroneous impression, that it had already been appropriated to another Genus; and a further objection was taken to it, from the similarity of its sound to Dalea, a genus so named after our countryman DALE: the first of these objections induced Professor WILLDENOW, in his *Species Plantarum,* to apply to these plants a new name, that of *Georgina,* (after

GEORGI, an eminent Russian traveller and botanist), which he retained in his other works, and in which he was followed by Mons. DE CANDOLLE; but the original name seems now to be fully established, and is retained in the new edition of the *Hortus Kewensis*, as well as by the French botanists.

The Dahlias are natives of Mexico, where they were found by Baron HUMBOLT, growing in sandy meadows, in the province of Mechoacan, between Areo and Patzcuaro, at 800 or 900 toises* above the level of the sea; from their native habitats, they had been transferred to the Botanic Garden at Mexico, in which, I understand, are to be found both the species, and some varieties of each.

CAVANILLES, who first described this Genus, having divided the plants which grew in the Royal Gardens at Madrid, into three species, was followed in this division, by Mons. THOUIN and Mr. SALISBURY, in their Memoirs, before mentioned, as well as by Professor WILLDENOW, in his *Species Plantarum;* the species were characterised by the form of the leaves, but these being found too variable to depend upon solely, Professor WILLDENOW afterwards, in his *Hortus Berolinensis*, took into consideration the absence or presence of the glaucous covering of the stem, and on this established a division of the Genus, into two species, by uniting the two first of CAVANILLES into one, and retaining the third of that author distinct; he still, however, made the shape of the leaves constitute part of his specific description. Mons. DE CANDOLLE, having ascertained that the florets of the rays of the two species differed, inasmuch as those of one were female, or fertile, and those of the other were neuter, or

* The toise contains six feet.

barren, rejected the shape of the leaves altogether, and on this, and the absence or presence of the glaucous covering of the stem, made up his specific characters, which have been adopted in the new edition of the *Hortus Kewensis.*

These various changes, together with some alteration of names, have caused an intricacy and confusion in the synonyms of the Dahlias, which I have attempted to elucidate in the following table, wherein all the names given by the different authors, whose works I have noted, are regularly arranged, under the two now established species.

1. Dahlia *superflua* caule non pruinoso, flosculis radii fœmineis. *Hortus Kewensis. Edit.* 2. vol. 5. 87.

Georgina superflua. De Candolle, *Ann. du Mus.* vol. 15. 310.

Synonyms of Cavanilles' *first Species.*

D. pinnata. Cavanilles, *Icon.* vol. 1. 57.

D. pourpre. Thouin, *Ann. du Mus.* vol. 3. 423.

Georgina purpurea. Willdenow, *Spec. Pl.* vol. 3. 2124.

D. pinnata. Buonaiuti in *Macd. Gard. Dict.* vol. 2. pag. penult.

D. sambucifolia. Salisbury in *Hort. Trans.* vol. 1. 90.

Georgina variabilis α (purpurea). Willdenow, *Hort. Berol.* vol. 2. 93.

——————————— *Enum. Hort. Bot. Berol.* 899.

Synonyms of Cavanilles' *second Species.*

D. rosea. Cavanilles, *Icon.* vol. 3. 33.

D. rose. THOUIN, *Ann. du Mus.* vol. 3. 421.

Georgina rosea. WILLDENOW, *Spec. Pl.* vol. 3. 2124.

D. rosea. BUONAIUTI in *Macd. Gard. Dict.* vol. 2. pag. penult.

D. sphondyliifolia. SALISBURY in *Hort. Trans* vol. 1. 91.

Georgina variabilis α (lilacina). WILLDENOW, *Hort. Berol.* vol. 2. 94.

——————————*Enum. Hort. Bot. Berol.* 899.

2. DAHLIA *frustranea* caule pruinoso, flosculis radii neutris. *Hortus Kewensis, Edit.* 2. vol. 5. 88.

Georgina frustranea. DE CANDOLLE, *Ann. du Mus.* vol. 15, 310.

D. coccinea. CAVANILLES, *Icon.* vol. 3. 33.

D. ponceau. THOUIN, *Ann. du Mus.* vol. 3. 422.

Georgina coccinea. WILLDENOW, *Spec. Pl.* vol. 3. 2124.

D. coccinea et crocata. BUONAIUTI in *Mac. Gard. Dict.* vol. 2. pag. penult.

D. bidentifolia. SALISBURY in *Hort. Trans.* vol. 1. 92.

Georgina coccinea. WILLDENOW, *Hort. Berol.* vol. 2. 96.

——————————*Enum. Hort. Berol.* 899.

The names *superflua* and *frustranea*, by which the two species are now distinguished, are terms designating that part of the character of the plants, which depends on the fertility or

barrenness of the rays of the flowers. By the unscientific cultivator, it will perhaps be regretted that the appellation of *variabilis* or *purpurea,* has not remained to the first, and that of *coccinea* to the second, as more intelligible to himself; he will also, no doubt, reflect on the frequent changes of name of both species, but especially of the first, which, in passing through the hands of five of the most eminent botanists of their time, was successively called, *pinnata, purpurea, sambucifolia, variabilis,* and *superflua.*

From what we at present have observed of these plants, in all their variations, there can be little difficulty in distinguishing the two species, by duly considering *all* the characters of each ; it is possible, that a singular variety of one may possess some, though not all the characteristics of the other. The *superflua,* or *purple* kind, is more coarse and diffuse, in its growth and habit, whilst the other kind is more delicate and compact, as well as more upright ; the stems of the *frustranea,* or *scarlet,* are perfectly round, and though in most cases quite as tall as those of the other, are generally slighter, are always much covered with a glaucous dew, resembling the bloom on a plum, and are never hairy or downy ; the leaves of the *frustranea* are smaller, of a brighter green, and of a slighter texture than is observable in the *superflua ;* and the portions of the leaves of this last are generally broader than those of the other species. The flowers also of the *frustranea* or *scarlet,* in plants of equal vigour and health are uniformly less than those of the *superflua,* and the florets of its disc, or centre, are more elevated above the level of the ray. Mons. De Candolle has also noted a difference in the roots of the two species, which will be very serviceable, to

distinguish them in winter; the tubers of the *superflua* are always closely united to the main stem, whilst those of the *frustranea* are more or less appended to it, by short strings or fibres.

The plants from which the three supposed species were described, were sent from the Botanic Garden at Mexico, to the Royal Garden at Madrid, in which the one called by Professor Cavanilles *pinnata*, flowered in October, 1789; his *rosea* and *coccinea* produced flowers a few years afterwards, and all were successively figured and described by him in his *Icones*, the first in 1791, the two last in 1794: they do not seem, however, to have been successfully treated, for it appears that with him they attained the height of three or four feet only, and did not flower till October. In 1802, plants of each were transferred from Madrid, to the Jardin des Plantes at Paris, where they grew so well, as to enable Mons. Thouin, in 1804, not only to describe and figure them, but also to treat on their cultivation. In May, 1804, seeds of the three kinds were sent from Madrid, by Lady Holland, to Mr. Buonaiuti, in England; from these, good plants were produced; one of which, the *pinnata*, flowered in the September following, and was figured by Andrews in the *Botanist's Repository*. In the succeeding year, plants of the *rosea* and the *coccinea* also flowered at Holland House. Though this importation of the seeds was the most successful, as to its produce (for from it nearly all the plants then in our gardens were obtained), yet the original introduction of the first opecies was (on the authority of the *Hortus Kewensis*) from Spain, in 1789, by the Marchioness of Bute; but it is probable that the plant so introduced was soon after

lost, as I do not find any further notice of it. The other species, then called *coccinea,* was actually flowered by Mr. JOHN FRASER, at Chelsea, in June 1803, when it was figured in the *Botanical Magazine;* this plant afterwards perished: Mr. FRASER is said to have obtained it from France in 1802, the same year in which it was introduced from Spain into the French gardens. It also appears that in the autumn of 1803, Mr. WOODFORD flowered at Vauxhall, a plant of CAVANILLES' *rosea,* which he had obtained from Paris, so that, inpendently of the one introduced by the Marchioness of BUTE, in 1789, it seems that both species had flowered in this country, before the seeds were transmitted by Lady HOLLAND.

It will be impossible, separately, to describe all the varieties at present existing; but it may be curious to trace the progress of their increase, in which it seems as if some period of actual cultivation were required, before the fixed qualities of the native plant gave way, and began to sport into those changes which now so much delight us.

At Madrid they were a long time in the Royal Garden without any indications of change; and it will be seen that after they were spread through Europe, some years elapsed before any extensive increase of variation took place.

Of the three sorts described by CAVANILLES, one (his *pinnata)* was semi-double; there were only three plants sent to Mons. THOUIN in 1802, from Madrid, and we must conclude, that they were the same as those noticed by CAVANILLES, because, Mons. THOUIN, in his description of each of them, separately refers to the figures and descriptions of CAVANILLES' *Icones.*

Mons. De Candolle, I am informed, obtained also from Madrid, the plants which he cultivated at Montpelier, about the same time they were sent to Paris. His Memoir was printed so late as 1810, and he therein describes only five varieties of *superflua*, viz. *rubra, purpurea, lilacina, pallida,* and *flavescens*, and three varieties of *frustranea*, viz. *coccinea, crocea*, and *flava*; he probably had not, when he wrote, obtained any double flowers, though he evidently expected such would soon be produced.

Mons. Otto, as early as 1800, obtained from Dresden, for the Royal Garden at Berlin, a plant of the *pallida* of the *Hortus Berolinensis*; and in 1802, a plant of the *purpurea* of the same work, was sent to him from Madrid; but he had no new varieties from his own seed till 1806.

Thus it appears, that the chief gardens of France, Germany and England, were originally stocked with plants from Madrid; but a fresh supply was brought from Mexico by the Baron Humboldt, who, in 1804, gave native seeds to the Jardin des Plantes at Paris, and some were also sent by him, in the following year, to Mons. Otto, part of which produced the first plants of the *coccinea*, which were grown in the Berlin Garden.

The history of the Dahlias now approaches the period, when they began to give indications of their future extensive increase in variety; for the account of what was done on the continent, I am indebted to the communications of the two gentlemen, by whose skill and industry, principally, I believe such great changes were effected in France and Germany.

The Count Lelieur began to direct his attention to the Dahlias in 1808: from the garden at Malmaison, he intro-

duced into the flower garden at St. Cloud, three distinct varieties, one variety being already there: from the seeds of some of these he obtained, in the following year, several plants differing in colour from the originals; the next year great attention was paid to separating the seeds of each sort, conceiving that their produce would, in some measure, follow the parent plant, but the result was not what had been expected; the young stock differed much from the old, and from each other, and yielded flowers of the most beautiful description, purples, dark reds, cherry reds, buffs, and even pale yellows; and by continued attention to their cultivation, the seedlings in the Royal flower garden, in each new year, presented differences in colours and forms, which seemed almost new creations; one of the most remarkable of these was a plant with pure white flowers. Amongst the plants raised at St. Cloud, Count LELIEUR mentions three with double flowers, the purple, rose, and buff, as well as several striped and shaded single ones. It is to the liberality of the Count, that the Horticultural Society is indebted for the fine assemblage of Dahlias, which are now in its Garden, the roots having been presented by him in the last spring.

The first introduction of the Dahlias into the Royal Gardens at Berlin, has been already noticed, as having occurred between 1800 and 1805. Mons. OTTO has informed me, that the chief varieties were raised between 1809 and 1817, but that the first which shewed themselves were produced in 1806 and 1807. About 1813, he began to pay more particular attention to their cultivation, and improved their kinds by cross impregnations of the stigmata of the florets. The first double flower he possessed came from Stutgard, but a complete double one of his own, flowered in 1809; it was

dark red, exactly similar to that from Stutgard; this had at first blown only semi-double. Three more double ones were raised in 1815 and 1816, and he has, at present, in all, six with double flowers. A pure white single one was given to him in 1809, and in 1810 he raised another white one himself. He mentions that in the Catalogues of the Nurseries at Berlin, from 80 to 100 sorts are enumerated for sale, but that he considers the really good ones to be about thirty.

Professor Willdenow sets down only three distinct varieties, to each of his two species, in the enumeration of the plants of the Berlin Garden, in 1809; those of his *variabilis, (superflua)* he calls *purpurea, lilacina,* and *pallida;* those of his *coccinea (frustranea)* are the same as described by Mons. De Candolle. But in his *Hortus Berolinensis,* which appeared before his *Enumeratio,* he says he has several varieties; and he adds that the same roots vary their colours in different years, which circumstance I do not find to have been observed by any other person.

In our own country, we had an early promise of great success, and had we hit upon the right plan of management, in keeping the plants, when produced, I do not doubt, but we should have been equally successful as the continental gardeners in obtaining varieties. Mr. Buonaiuti saved seeds from the plants he raised in 1804, the produce of which seeds he states to have given him, in the succeeding year, nine varieties of that which was called *pinnata,* two of which were double, one with lilac and the other with dark purple flowers; of the single flowered plants, some were certainly dark coloured, for figures were published from them at the time; the paler coloured varieties were chiefly considered as belonging to what was then called *rosea;* he had also to

varieties of *coccinea,* the original deep coloured one and a paler one, which, though called by him *crocata,* was the pale yellow variety, as is apparent from the figure of it, published in the *Paradisus Londinensis.* Mr. Salisbury also obtained several varieties from the seeds which he received from Holland House, in 1806; these he has particularly noticed in his Paper, printed in the first volume of the *Transactions* of the Horticultural Society. In the fifth volume of the second Edition of the *Hortus Kewensis,* which was published in 1813, the varieties of *superflua,* there named, are *purpurea, lilacina,* and *nana,* the latter being taken from a double variety, figured in Andrews's *Botanical Repository,* but which is certainly not particularly entitled to be considered as a dwarf plant. No varieties of *frustranea* are given in the *Hortus Kewensis.*

The plants of the *superflua,* or *purple* species, raised from seeds, vary extremely in the form of the leaves, and the appearance of the stems; but as these differences do not at all affect their beauty in the eye of the cultivator, nor are worthy his attention, it will be unnecessary to notice them further, than to observe that it was a variation in this point, which caused the separation of this species into two, by the early writers on the genus. The plants vary also very much in stature; some grow to, and even exceed, eight feet in height, whilst others scarcely reach four feet. I have observed that the tall ones are frequently less productive of flowers, as well as later in flowering, and are of much more rambling habits than the dwarf ones, which are therefore to be preferred. Considerable differences are also found in the shape of the tubers of the roots.

The varieties of the *superflua,* with single and semidouble

flowers, are most numerous, for the collections in the principal nurseries round London consist of from 100 to 150 with names, exclusive of unnamed ones, all of them having differences, and being of such merit that the most inferior would have been eagerly sought after, four years ago; in general, only one flower is produced on each peduncle, though some plants have two; the colour of the florets of the ray of the flower are of different hues, passing from the darkest purples through lighter shades, into various deep and lighter reds, approaching to scarlet, and proceeding through pale purples and lilacs, into what have been called rose-colours, but which may be more properly described as buffs (*nankin* of the French,) gradually becoming paler until they arrive at different shades of yellow. In the gradation of the colour of all, with the exception of the white varieties, it seems as if purple and pale yellow were at the extremities of the scale, and that the intermediate hues were composed of a mixture of red with one or other of these colours. Perhaps this observation may not be found to apply in some few instances; there may be exceptions to so general a rule: but I have in vain sought after a pure scarlet; and I have not been able to discover a pink or flesh coloured flower, free from all tinge of either purple or yellow. Mons. De Candolle, in his Essay on the Genus, has observed, that it is not probable we shall ever see a blue one, since the variation is from purple to yellow. He considers blue and yellow to be the fundamental types of the colours of flowers, and that they mutually exclude each other; yellows pass readily into red or white, but never into blue; and in like manner, blue flowers are changed by cultivation, into red and white, but never into yellow.

The darker flowers have the appearance of velvet, and have consequently a richness, which the lighter-coloured ones do not possess. In some cases the ground colour of the floret of the ray is, as it were, striped (*panachée* of the French and Dutch), in others, the same colour is equally diffused over the whole; the stripes are sometimes on the margins, sometimes in the centre of the florets, in great variety of ways; and are particularly beautiful, when one of the colours is velvety, and the other bright; but this property of being striped is not permanent, it seldom shows itself with the earliest, and is not more abundant in the latest flowers; it is probably the effect of some modification of the juices of the plant, as it approaches its decline. The florets of the ray of some plants are of a darker shade at the bases, becoming paler at the margins, but of this description I have seen in Messrs. Whitley and Co's garden, at Fulham, some peculiarly striking plants, where the lower parts of the florets are of one, and the superior parts, of another hue; the lower part, shewing a circle of a distinct colour round the disc, making, as it were an eye in the centre of the flower. Mr. Lee, of Hammersmith, lately pointed out to me, in his garden, a new character of variation; the disc, in all I had hitherto observed, was a bright yellow; in three or four cases, with him, it was dark, the consequence of the tips of the tubular florets being tinged with brown, or purple; these varieties are very handsome at the period when the outer florets only of the disc are blown, and shew a circle formed of their yellow stamina interposed between the dark colours of the ray, and those of the centre of the disc, the whole flower then appearing of three colours. The size of the flowers, in different plants,

varies, their diameter being sometimes only three, in other cases full six inches. The shape and expansion of the individual florets of the rays, are also very different; some are broad, others narrow, the former being much the best; some have their ends terminated by a point, others are broken into two or three divisions; in some each separate floret is quite flat, in others they are hollowed or cupped; others again are ridged, or ribbed; and I have seen a few, with the rays tubular, the florets being united at the edges, a state, perhaps more singular than elegant, but it is not constant, for the plant which produces tubular rays in one season, will have them fully expanded in the next. In another class, the rays of the flower are not regularly or evenly shaped, being lengthened out and bent obliquely sideways, assuming a character very different to the view, from the other kinds. The rays sometimes are turned backwards, or recurved, sometimes they incline forwards, but most commonly are flatly expanded.

The white varieties of the Dahlias, with one exception, are very similar in their flowers, which are below the average size; they have been sought after with more eagerness than, I think, they deserve, their chief merit, consisting in their singularity; a collection is not, however, complete without some of them, and in the mass they form a fine contrast to the darker coloured flowers; the exception I have made, is a plant, sent to the Society, by the Count Lelieur, the flowers of which are equal in size, and grandeur of appearance, to the best of the coloured varieties. I have lately seen a plant, the flower of which has its rays white, with the slightest dash of purple diffused through it; it is one of the most striking varieties I know.

The flower, in its natural state, has eight radiate florets or petals, as they are erroneously called: when these are increased in number the flowers become semi-double; this change being produced by the conversion of the outer florets of the disc or centre, which are tubular, into ligulate florets, like those of the rays; in good collections, these semi-double flowers are as numerous as the single flowers, the number of radial florets varying from ten to twenty, and upwards. When the whole of the disc is changed into radial florets, the flowers are called double, of which about eighteen are enumerated in the English collections, as well as in the Dutch Catalogues; they have mostly received fancy names, not founded on any peculiarity either of colour or character. The double ones first raised, were the purple and the lilac; the purple have since become more numerous, differing only in circumstances of form and size, the largest measuring nearly six inches over; of double ones there are also a very grand buff, and a most beautiful pale yellow, as well as several dark reds; I have been told of a double white, but have doubts of its existence at present. Independent of colour, the mode of growth and arrangement of the multiplied radial florets, will form essential points in the double flowers, as these varieties increase in number. It has been objected to them, that they are not only tardy, but very shy in producing their flowers, but this does not equally apply to all the sorts, some of which seem to yield their flowers better than others, though certainly with less freedom than the single ones. Semi-double flowers often appear on plants considered as double: frequently both descriptions of flowers exist at the same time, and it sometimes happens that a plant for a whole

season, will be semi-double, and will resume its better character in the next.

Such, and so numerous, are the varieties of the *superflua*, or purple species; and when it is considered that they are the effect of, at the utmost, twelve years' cultivation, and that much the greatest part have been raised within the last four years, in the English gardens, all speculation is vain, on what may be effected hereafter, or even in a very short time, in the production of new changes and alterations. There is one known variation of Syngenesious flowers, which has not yet been attained, I mean that in which the tubular florets of the disc become lengthened and quilled, whilst the florets of the ray continue in their natural state. But I have seen one kind of deviation from the general appearance of these plants, which, if not unique, is certainly very unusual in this natural order; the rays throw out several processes resembling distinct petals, from the edge of the tube of each floret, and thus each separate floret actually becomes a double flower; the compound flower has in consequence, a very full and broken appearance.

The *frustranea*, or scarlet, has not yet sported much; the three distinct varieties, originally described by authors, still exist under the name of *coccinea*, *crocata* or orange, and *lutea;* plants bearing flowers with colours intermediate between these, have been raised; there is also one variety of it called *fulgens* in the nurseries, the colour of which is much more intense and brilliant, than that of the original *coccinea*, and the plant is singular besides in possessing a stem unusually tall and strong. It was raised by Mr. Johnson, a few years since, in the garden of Mrs. Hatch, at Claybury Hall, in

Essex, with whom he then lived as gardener; the plant sprang from seeds, received direct from Mexico, it is not, therefore, derived from any of the first imported plants or seed; it generally has twelve or more florets in its ray, ranged in one series, not in a double row, as in the semi-double flowers. This species does not seem to possess the property of variation, like the other, for all its changes are, in fact, only into shades of the original colour. It has been slow also, in showing a disposition to become double; the first approach to the character of a double flower, that I have seen, was in a plant raised by Mr. Cormack, this year, in his nursery at New Cross, near Deptford: in it, the radial florets are increased in number to near thirty, and being of a rich colour, the whole flower is very fine. The seeds of the *frustranea* do not ripen so freely as those of the other species. It must be observed, that though the colour of the flower of this species was originally called *coccineus* or scarlet, it ought more strictly to have been described as *miniatus*, for it is the exact colour of red lead.

As the two species have been continually growing contiguous to each other, and as some pains have been taken to disperse the pollen of the various flowers, it has been supposed that hybrid plants have been produced: those which have been pointed out to me as such, though they certainly have appearances which might justify the supposition, have not, to my view, more diversity of character, than may fairly be supposed to have arisen from pure seeds of the *superflua*, which we know has sported into such extraordinary varieties. There are, unquestionably, variations sufficient to destroy the accuracy of the specific characters of the two

species; the branches of some of the varieties of the *superflua* are smooth, and covered with a glaucous bloom, and I have found many instances, in which the florets of the ray are entirely destitute of stigmata. The leaves in all these doubtful cases preserve the true character of the *superflua*, whilst the flower approaches more to the *frustranea*. The knowledge of the failure of the specific characters of Mons. De Candolle in these varieties, may have caused the opinion, which I understand is prevalent in France, that the two species should be reduced into one. I have considerable doubts of the propriety of such change, for I do not think it probable, that so distant a variety as the scarlet one must be, if there be but one species, should have been obtained at a period, when scarce any other existed; whilst all subsequent cultivation has not produced another so distant, from the original *pinnata* and *rosea* as this.

Subjoined is a table of all the published figures, of the different varieties of those plants, which have come under my observation.

Figures of varieties of D. superflua.

Single Flowers.

Cavanilles, *Icones*, vol. 3 tab. 365. D. rosea; not coloured.

Annales du Museum, vol. 3. page 420. tab. 37. fig. 3. D rosea; pale lilac.

Botanist's Repository, tab. 408. D. pinnata; bright purple.

Paradisus Londinensis, tab. 16. D. sambucifolia; pale rose with white at the base.

Macdonald's *Gardener's* Dict., tab. 19.* fig. 1. D. pinnata; dull purple.

Willdenow, *Hortus Berolinensis,* vol. 2. tab. 93. G. variabilis purpurea; reddish purple.

——————————— tab. 94. G. lilacina; pale lilac.

——————————— tab. 95. G. pallida; pale reddish purple.

Botanical Register, tab. 55. D. superflua ε; purplish red.

——— *Magazine,* tab. 1885 A. D. superflua; dark red.

Double Flowers.

Cavanilles, *Icones,* vol. 1. tab. 80. D. pinnata; semi-double, not coloured.

Annales du Museum, vol. 3. page 420. tab. 37. fig. 1. D. pinnata; nearly full double, purple.

Botanist's Repository, tab. 483. D. pinnata nana; nearly full double, pink, intended for lilac.

Botanical Magazine, tab. 1885 B. D. superflua; full double, purple.

Figures of varieties of D. frustranea.

Cavanilles, *Icones,* vol. 3. tab. 266. D. coccinea; not coloured.

Annales du Museum, vol. 3. page 420. tab. 37. fig. 2. D. coccinea; dark orange.

Botanical Magazine, tab. 762. D. coccinea; scarlet.

Paradisus Londinensis, tab. 19. D. bidentifolia; pale yellow.

Macdonald's *Gardener's Dict.* tab. 19.* fig. 2. D. crocata; yellow.

Willdenow, *Hortus Berolinensis,* vol. 2. tab. 96. G. coccinea; scarlet.

New varieties are to be obtained from seeds, which should be gathered from those plants, whose colours and character are most likely to please, always taking from the dwarfer ones, where no preference exists on other accounts; many of the seedlings will follow their parent, therefore all that are raised will not be new varieties. Double flowering plants are more likely to spring from the seeds of semi-double flowers, than from those of quite single ones; and it is possible, though the experiment has not yet been tried, that seeds obtained from those particular florets of the disc, which have altered their from, may have a greater tendency than others, to produce plants with double flowers.

The seeds are to be sown in March, or earlier, on heat, the young plants, if necessary, to be pricked out into pots or boxes, and kept under cover in warmth until the end of April, when they may be planted out where they are to remain, covering each plant for some time, with an empty pot at night, to avoid injury from spring frosts. Where Dahlias have been planted the preceding year, many young plants will arise from self-sown seeds; these may remain in their original place, or be removed. The seedlings should be planted in rows three feet apart, and two feet distant from each other, in the row; this will allow sufficient space for a person to walk between them to examine the different varieties. They thrive best in rich loam, and require a clear open space to grow in; the shelter of trees or of walls being injurious to them. They seem to suffer in some gardens, if planted often in the same place, therefore, where there is not space to enable the grower to move their quarters in successive years, it will be advisable to add some fresh

maiden earth to the soil, when they are to be continued in the same spot. As they are liable to much damage from wind, they should be carefully tied to stakes as they grow. The seedling plants thus treated, will blow in July, and continue in perfection till the autumn, but the first frost injures their foliage and the beauty of the flowers, which may, however, be preserved somewhat longer, by moving the smaller plants, with balls of earth, into large pots, and keeping them under cover in the green-house, or conservatory.

Until a seedling plant shows its flowers, there are no means of ascertaining its value ; the stems of those which produce dark flowers, are in general brown or a dark purple, whilst the paler flowers grow on plants with lighter, and the white flowering ones with perfectly green stems ; but, I conceive, that even these distinctions are not constant. The proper time to judge of the full merit of the flowers, and consequently to select the plants is the morning, for the sun injures the brilliancy of the flowers ; and the summer flowers are much superior in beauty to those produced later in the season ; though perhaps in September and October, before any frost comes, the quantity of flowers which are then in blow at once, makes the show of that period the most splendid.

In the selection of the varieties, the fancy and taste of the cultivator, must be the only guide in the choice of colours, and the character of the flowers ; the other points to be attended to, are the disposition to blow freely, and the having short peduncles, on which the flower stands boldly and well expanded to the view ; these properties generally belong to plants which grow compact and close, and not rambling.

Where any particular variety is approved, and an increase is desired, it may be made by cuttings of the young shoots of the branches, taken off the plant, as soon as may be, after its merit has been ascertained by its flowering; these cuttings will readily strike in a moderate heat, under cover of a hand-glass; in a favourable season, they will grow in plain earth, under a glass; such cuttings, in either case, if made in good time, will form roots and tubers before the autumn.

Soon after the leaves and young branches of the plants have been destroyed by the frost, they should be cut down; those which are to be left in the ground, must be protected by small heaps of dead leaves, or tan, and if kept quite free from the attack of frost, or injury by damp, will grow well the next season. But it will in general be advisable, especially with the more valuable kinds, to raise them from the ground with their roots and tubers entire, retaining a small portion of the stem attached; to plant them in pots in dry mould, and so keep them in the back of a green-house, or other dry and airy place, free from the access of frost, until the spring. The object in the preservation of the roots during the winter, is to keep them sufficiently moist, to preserve them plump, and yet not so as to be rotted by damp, or spoiled by frost; any situation therefore, where this can be effected, will answer equally with the more troublesome plan of potting each root: they will do very well if laid on a cool floor in a green-house, or fruit-room, and may be then covered with coal-ashes, sand, or other dry substance, but when thus covered, they should be placed with their crowns erect, and exposed to the air; the under parts of the

roots only, should be covered over, exactly as if they were planted. In the spring, the roots, if small, may be left as they are; or if large, they may be divided; in the division, each tuber which has a bud growing on it, will form a plant, after the division has been made.

The roots which have been preserved through the winter, are to be put out when all danger of frost is over; but previously to this, they must be potted and well attended to, in the green-house, where they should be kept; the object being, to bring them as forward as possible, in order to obtain early flowers, without forcing them; if the shoots are at all drawn, the plant will be unsightly, and the flowers will not be so full and handsome as they ought to be.

The plants to be thus put out in the spring, will be distributed on the borders, or into clumps, as may suit the fancy of the cultivator; they look best, however, in a large mass unmixed with other plants; in this plan of growing them, some nicety is required in the due distribution of the sorts, so as to have a proper and good mixture of colours; and particular care is necessary to keep the tallest plants either in the centre or at the back of the clump, according as it is destined to be viewed, from one side only, or on every point, and to place the whole so that there shall be no unevenness in the general shape of the entire mass, arising from the irregular arrangement of the individual plants, according to their respective heights. The roots should be planted about three feet from each other every way; this distance will keep each sufficiently distinct, and yet so united that the whole clump will have the appearance of an unbroken wood or forest of Dahlias. They look very hand-

some if planted in the manner of an avenue, in a straight line, on each side of a walk. The earliest flowers will appear in June.

In the spring, another opportunity will occur of increasing by cuttings, the known varieties, which are then to be planted out. It is expedient to retain only a single stem to each plant, and as several shoots will often arise from one root, all but one should be removed, and these will form excellent plants, if treated in the manner before directed for the cuttings from the seedlings; they will blow in the same season, but a little later than their parent roots, and as they will be rather shorter, may be conveniently placed in front of the older stock. Other cuttings besides these shoots from the roots, will become blooming plants in the same season, if taken off early.

In general, an abundant supply of water to the roots is not serviceable, it drives the plants into leaf and height, and consequently retards, and even diminishes the flowering; but in the last season of excessive heat and dryness, many plants must have failed without watering, except where they grew in particularly rich soil, or in moist situations. Great heat seems more than usually unfavourable to the flowers of these plants, for until the intensity of the warmth of the past summer had abated scarce a single flower of a Dahlia was seen; the buds, though fully formed, did not open, but were abortive; as soon, however, as the weather became more temperate, the shew of flowers was great.

Some speculations have been made on the utility of the roots as food; Mons. Thouin suggested this in his Memoir,

and Professor WILLDENOW states, that when dressed, "saporem haud ingratum habent." M. DE CANDOLLE, however, does not give a very tempting account of their edible properties; but the opinion in France, of their merit, was such, that they were regularly introduced into the Catalogue of the Plantes Potagères in the *Bon Jardinier*, for 1817. I have tasted them; the old tubers are very hard, but the young ones are more tender, when boiled; they have a weak aromatic flavour, something resembling ginger, which is stronger in the coat than in the substance of the root; without this, they would be perfectly insipid, and I do not believe, that even the advantages of a good sauce, would make them sufficiently palatable to be used, except as a matter of curiosity.

XLVII. *Observations upon the Glazing of* Hot-houses, *and* Conservatories. *By* JAMES ROBERT GOWEN, *Esq.*

Read October 6, 1818.

As I do not observe in the *Transactions of the Horticultural Society,* any account of the improved methods of glazing, I have drawn up this Paper in the hope that a more extensive knowledge of their advantages may secure them a general introduction into gardens. In the usual method, each pane of the roof-lights is cut into the form of a parallellogram, and made to lap over the one immediately below it, in a larger or smaller proportion, according to the fancy of the gardener or glazier. The rain being impeded in its progress downwards by the interruption in continuity of the glass, hangs upon the edge of the pane till it is attracted by the bar, down the sides of which it runs in a stream, and insinuating itself between the putty and the glass, accelerates the decay of the frames; and where the slightest defect exists in the putty, penetrates into the house, where it will be found to be the most frequent cause of drip: that arising from the condensed moisture of the interior being comparatively small in quantity. Another serious mischief is occasioned by the broad film of water which collects between the lapping of the panes, and which freezing in severe weather, expands and breaks the glass to so great a degree,

that I have seen half the panes of a green-house destroyed in this manner in the course of one winter. This evil is sometimes attempted to be remedied by making the lappings very narrow, but in this case, when rain is accompanied by high wind, a considerable quantity of water is found to penetrate into the house. The circular glazing is free from all these defects, which it possesses the merit of obviating in a manner equally simple and efficacious. Who was its contriver, I have not been able to ascertain, but I believe it to be an old invention recently revived; and the principle has been used for ages in weather-tiling the fronts of houses, as may be seen in many old buildings in country towns. The whole contrivance consists in cutting the upper and lower edges of each pane into the shape of the segment of a circle, the lower convex, the upper concave. (See figure 1.) To effect this with the greater truth and facility, a trammel should be made of the length of the radius of the intended segment of a circle, and perforated at its extremity by a small hole of the proper size, for the insertion of the glazier's diamond. It being then made to traverse upon the surface of a smooth board, the glass is easily cut to an accurate curvature. But as both the upper and lower edges of the pane must be of the same degree of curvature, and it should remain, during the operation, unmoved, with the glazier's hand kept steadily upon it, the trammel must admit of a rectilinear as well as a circular motion, which is effected by a very simple contrivance, for which I am indebted to Mr. Wenman, Nurseryman of South Lambeth. A deep groove being accurately cut down the middle of the board, rather longer than the panes intended to be operated upon, a small

nut must be made to slide in it, to which the trammel is to be annexed by a small pin, round which it turns. The pane is now to be placed with its middle exactly opposite to the bottom of the groove, and its upper edge at right angles to it, and confined in this position by a small piece of wood, of not quite its own thickness, glued to the surface of the board, in a direction parallel to, and touching its side. The diamond being then placed in the trammel, the upper curve should be cut, when without moving the pane, the trammel should be drawn down the groove, till it is brought into the proper position for cutting the lower curve. A reference to the annexed figures will make this description more intelligible.

In a pane eight inches in width, a curvature of five-eighths of an inch deep in the centre will be sufficient. The glazing is to be executed in the usual manner, except that the panes should lap over each other as little as possible; a lap of one-eighth of an inch is ample, less will do; and however small the lap, no rain will ever penetrate. In a house glazed in this manner, all the moisture which falls upon the glass, irresistibly gravitates round the circular edge to the centre of the pane, down which it runs in a continued stream, and upon examination, none will ever be found to run down the sides of the putty. From the extreme smallness of the lapping, no breakage ever happens from frost, and the loss of light occasioned by the film of dirt, which always accumulates between the panes, is much lessened.

Those who prefer a close house, may bed the panes with putty between them, taking care to insert a narrow piece of smooth and thin wood previously, at the centre, which being

Trammel for cutting circular glass for Hot-house and Conservatory roofs.

REFERENCES.

Fig. 1. *Panes of Glass cut circularly, and lapping about ⅛ of an inch.*
Fig. 2. *Trammel Board.*

- A. *Groove in which the Trammel moves, in a rectilinear direction.*
- B. *First position of the Trammel.*
- C. *Second position of ditto.*
- D. *Pane of Glass placed in the direction for being cut.*
- E. *Glazier's diamond, inserted in a hole made to receive it.*
- F.F. *Dotted lines shewing the curved form of the pane when cut.*

Fig. 1.

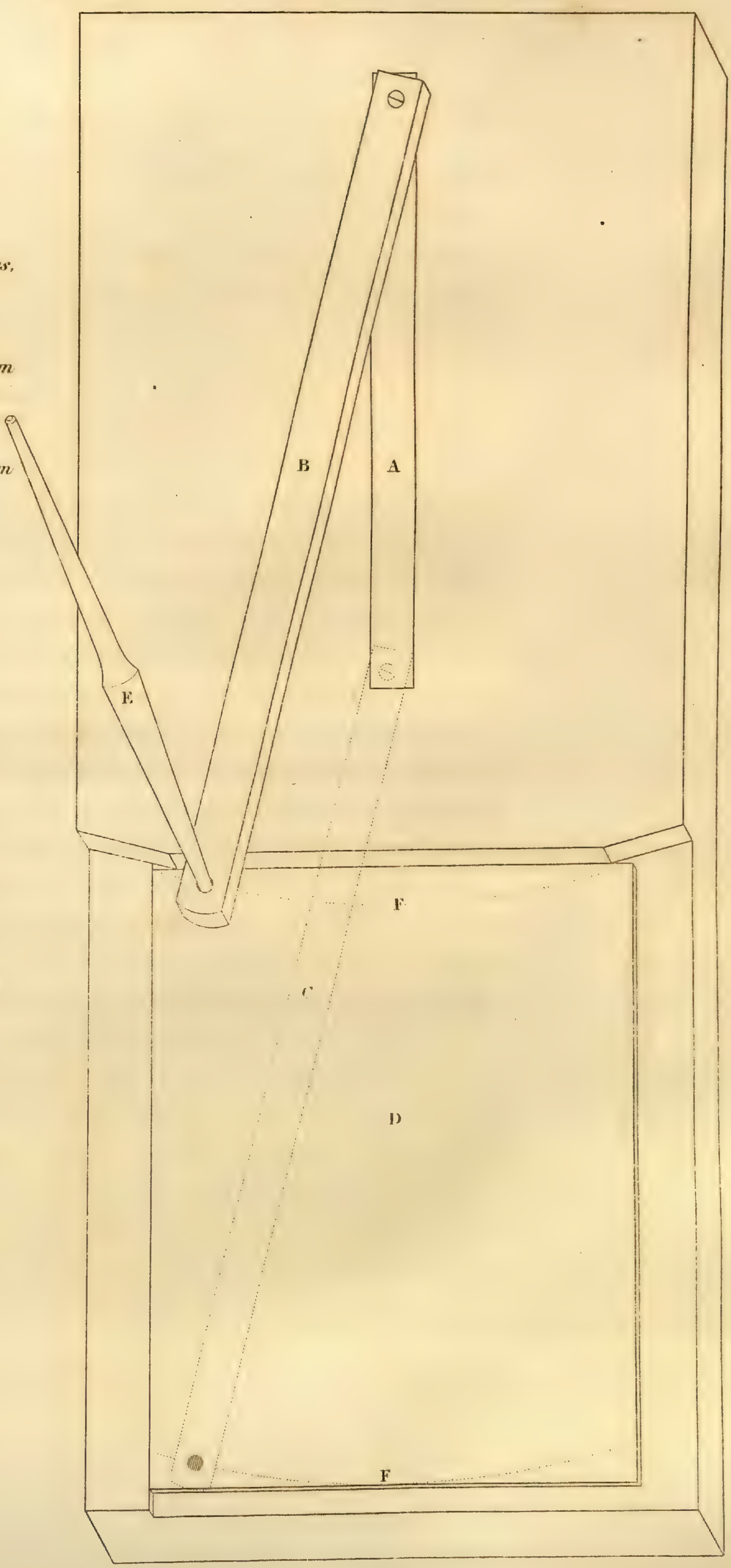


Fig. 2.

withdrawn, after the pane is pressed down to its bearing, will leave an aperture for the escape of the condensed moisture within, and with this precaution, little or no drip will take place. The advantages of the circular glazing are so great and obvious, it is so much neater in appearance, and attended with so little additional expense, that no person after trying it, or seeing it in practice, will think of following the ordinary method. A person at Birmingham has obtained a patent for what he terms Shield Glazing. He cuts the edges of the pane, not into a curve, but into an angular form, with a small semi-circle at the vertex of the angles; it is evident that this scheme is but a modification of the circular method, over which it possesses no apparent superiority, and it is certainly more difficult of execution.

Some practical observations may not be useless: they are applicable to any species of glazing. In preparing the putty, the oil should be old, and the whiting thoroughly dry; a short exposure to fire heat is insufficient, it should be kept in a very dry place for a considerable time, moisture adhering to it with great obstinacy. The putty should be prepared in quantity some time before it is used, and allowed to remain in a mass; the more it is beaten the better it will be. When the lights are finished, they should not be put upon the house till the putty be well hardened, for if exposed to rain or frost prematurely, it will never acquire that solidity which it would under opposite circumstances: striking instances of this fact have fallen under my observation. The putty should not be painted till it begins to acquire a hard and dry surface. After the panes are bedded in the putty, and before the front putty is laid on, it will be a great improvement

to paint the rabbet, both the wood, and the portion of the glass which will be covered ; not only will the penetration of any moisture round the panes be rendered more difficult, by the paint filling up every interstice, but the front putty will adhere much more strongly to the painted, than to the unpainted glass. Considerable advantage will be derived from classing the panes, placing together, in one set, those which are perfectly flat, and those which are not so, in another. This is easily done by the glazier, either when cutting the glass, or subsequently ; and each glass being used together, much greater closeness of glazing, and neatness of workmanship, will be ensured.

The Pitmaston White Cluster Grape

XLVIII. *An Account of the* Pitmaston White Cluster Grape; *with some Observations on the* Training of Vines on an open wall. *In a Letter to the* Secretary. *By* JOHN WILLIAMS, *Esq. Corresponding Member of the Horticultural Society.*

Read, December 15, 1818.

DEAR SIR,

THE *Pitmaston White Cluster Grape*, which I sent you last month, and which you say was thought deserving of notice in the *Transactions* of the Horticultural Society, was raised by me from a seed of the Auverna, or Small Black Cluster (not the Miller) Grape. It has been in bearing, about five or six years, on the open wall; it produces rather a larger bunch, and ripens earlier than its parent. The berry is of a round shape, a little flattened at the point opposite to the stalk, and when perfectly ripe becomes of an amber colour, bronzed with russet on the side next the sun. As it ripens earlier than the old Dutch Sweetwater, and as the berries do not crack, I think it will succeed well for early forcing under glass. The leaf of this vine is thin, has little pubescence, its colour is a fine dark green, in the early part of the summer, and it dies off an uniform yellow, in the autumn.

The Pitmaston White Cluster is a great bearer, and sets its fruit well, unless cold rainy weather happens when it is in blossom; but, like the Miller and Black Cluster, it unfortunately forms a close bunch, with the berries much crowded;

this defect can only be remedied in young Vines, by the free use of the scissars; however, if the shoots are trained along a considerable extent of wall, the bunches spread out much wider, and the berries attain a larger size. This property of the vine, although known to experienced gardeners, is not taken advantage of, as it ought to be. A Vine might be trained horizontally under the coping of a wall to a great distance, and by inverting the bearing shoots, the spaces between the other fruit trees and the top of the wall, could readily be filled up, and if different Vines were inarched to the horizontal branch, the south wall of a large garden might be furnished with a variety of sorts from the stem and root of a single plant, the roots of which would not encumber the border in which the other fruit trees are growing. I have an experiment of this kind now in progress in my garden. Within a few years past, I have gradually trained bearing branches of a small Black Cluster Grape, to the distance of near fifty feet from the root, and I find the bunches every year grow larger, and ripen earlier as the shoots continue to advance. According to Mr. Knight's theory of the circulation of the sap, the ascending sap must necessarily become enriched by the nutricious particles it meets with in its progress through the vessels of the alburnum; the wood at the top of tall trees, therefore, becomes short jointed and full of blossom buds, and the fruit there situated attains its greatest perfection. Hence we find Pine and Fir trees loaded with the finest cones on the top boughs, the largest acorns grow on the terminal branches of the Oak, and the finest mast on the high boughs of the Beech and Chestnut; so likewise Apples, Pears,

Cherries, &c. are always best flavoured from the top of the tree. But I suppose there are certain limits, beyond which the sap would be so loaded with nutriment, that it could not freely circulate.

I am, dear Sir,

Your's sincerely,

John Williams.

Pitmaston, Worcester,
11*th Nov.* 1818.

XLIX. *Account of a Method of Constructing* Flues for Hot-houses. *In a Letter to the* Secretary. *By* James Robert Gowen, Esq. F. H. S.

Read December 15, 1818.

Dear Sir,

In the second volume of the *Transactions* of the Horticultural Society,* Mr. Knight remarks, "if a brick flue be made of much too great thickness, I have ascertained by experiment, that it will continue to absorb the heat of a moderate fire during months, without ever being hot itself, or materially raising the temperature of the house, though the air enter at a very high, and go out at a low temperature, and more heat disappear than would be sufficient to burn the plants, if the heated air were made to pass through a tube of cast iron."

The justice of the President's observation is incontrovertible, and as an opposite principle has generally influenced the construction of hot-house flues, I request you will do me the honour of laying before the Society some account of a flue which was built under my direction, in the Earl of Carnarvon's Pine stoves, at Highclere, in the summer of 1817, before I read Mr. Knight's paper, upon which it forms an excellent practical commentary; you saw the flue yourself last summer, but unluckily at a season when it was not in use. It entirely surrounds the house, and is completely insulated, being kept

* See Vol. ii. page 325.

two inches from the walls, and supported upon single bricks set one foot asunder, from centre to centre. It is thirteen inches and a half in depth, being made of three courses of common sized bricks (nine inches by four and a half,) laid edgeways, and one foot broad, the covering and bottom of the flue being formed of bricks one foot square. All these bricks are two inches thick, and panelled one inch in depth, the pannel occupying the whole surface of the brick, except one inch all round it. The brick is thus only one inch thick in the pannelled part, but being two inches thick at its sides, the flue is as strong as if it had been built of common paving bricks, at the same time that, from the thinness of the pannels, the heat is allowed to pass into the house with the greatest facility. The pannels are turned outwards, and those at the top are found useful in steaming the house, which they do well by being filled (when the flue is hot) with water, of which their depth and area enable them to hold a large quantity. Some additional heat-emitting surface is also gained in each brick, by the sides of the pannels. No difficulty was found in fabricating the bricks, they were made in the usual way, and in common moulds, a piece of wood slightly bevelled at the sides, of the dimensions of the intended pannel, being previously nailed upon the block on which the brick maker places his mould. Care was taken that they were made of mild clay, as the softer the brick, the more easy is the transmission of the heat. No parget was allowed to be applied over the inside of the flue, the closeness of the joints being secured by good workmanship solely. Its advantages were immediately felt to be great; with a much smaller quantity of fuel it heated the house more

effectually than the one for which it had been substituted; and it was not found that the house cooled, when the fire declined, more rapidly than it used to do. As long as any fire remains, the thin parts permit the heat to pass through, and the brick-work is altogether massive enough to be slow in cooling. A similar result has been attained in Scotland, by the use of *can flues*, or flues made of earthen cylinders joined longitudinally: these are very good, but more difficult to make and troublesome to repair, and their rounded surface renders it impossible to place a pot upon them. It may here be as well to remark, that in the arrangement of flues I have found great advantage result from attending to a hint communicated to me by that most zealous and successful horticulturist, the Hon. and Rev. William Herbert, who instructed me to carry the end of the flue on into the chimney directly over the fire-place, so that the chimney might be powerfully heated by the fire. A considerable rarefaction of the air is thus produced at the farther end of the flue, and as a constant equable draught is thus maintained, the flue becomes regularly heated all round, which never happens in the common way, where the circulation of the heated air along the horizontal flue, depending wholly upon the impulse given it by the fire, soon stagnates, and loses its elasticity, the heat being absorbed in the first half of its course, and the further part of the flue is only slightly warmed. The flues in Lord Carnarvon's and Mr. Herbert's hot-houses, which have been built upon this principle, keep regularly warm throughout, and there is scarcely a difference of temperature between the two extremities of the houses.

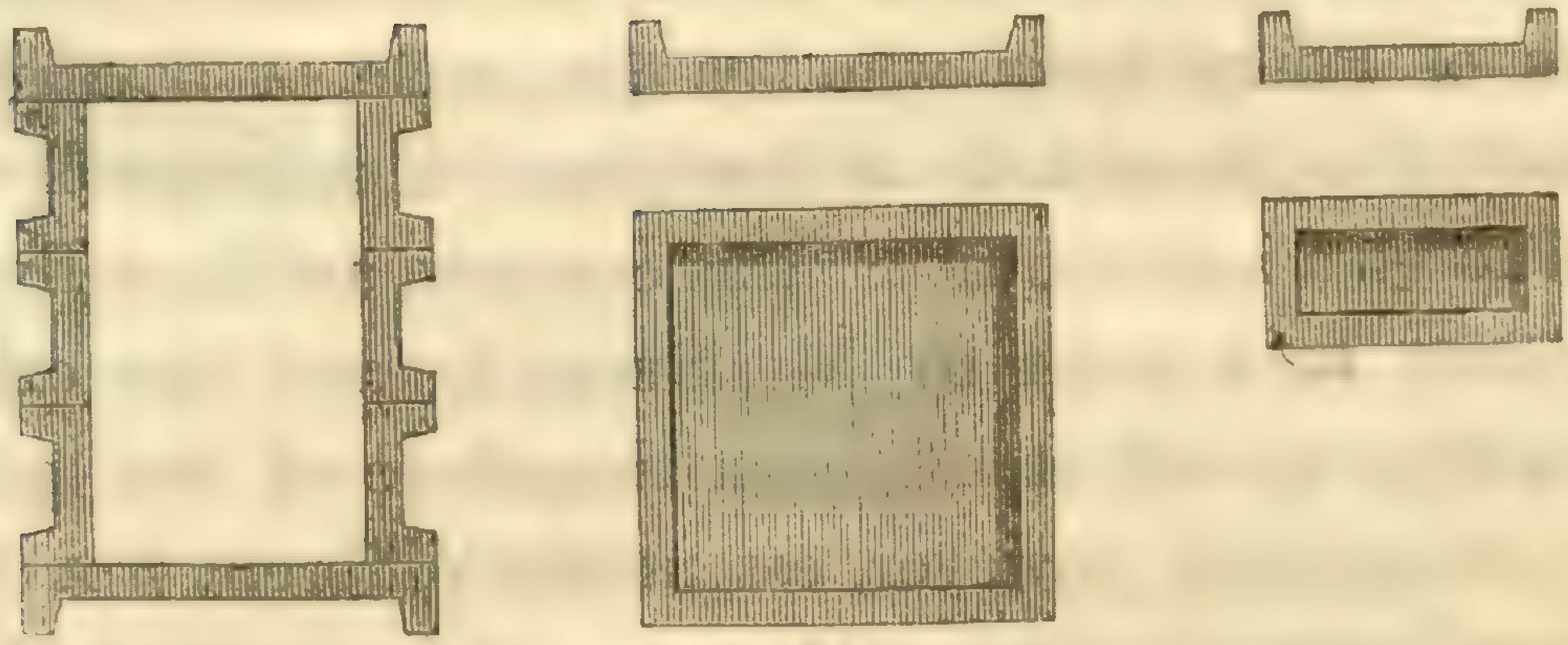
I cannot conclude this paper without observing, that I am fully convinced of the superiority of the mode of heating by steam, to every other; but to individuals who may not find it convenient to adopt that method, the information above given will not be without value. The following figures present plans and sections of the panelled bricks.

Believe me, dear Sir,

Your's very sincerely,

James Robert Gowen.

Highclere,
Nov. 5, 1818.



REFERENCE TO THE FIGURES.

1. Section of the flue.
2. Section of the top and bottom bricks.
3. Plan of the same.
4. Section of the side bricks.
5. Plan of the same.

L. *Some Account of the* Seckle Pear, *a new seedling raised in the Neighbourhood of Philadelphia. In a Letter to the* Secretary. *By* DAVID HOSACK, M. D. F. R. S. &c. *Foreign Member of the Horticultural Society.*

Read, January 5, 1819.

DEAR SIR.

THE *Seckle Pear*, eighteen plants of which I have forwarded to the Horticultural Society, is so named, from Mr. SECKLE of Philadelphia, who has the credit of having first cultivated it in the vicinity of that city. It is generally considered to be a native fruit of this country, accidentally produced from seed sown by Mr. SECKLE; and the original tree is said to be still standing on the estate of that gentleman. An account, however, essentially different from this, has been lately communicated to me, by my friend, Judge WALLACE, of Burlington, to whom I recently paid a visit. He stated to me, on the authority of a correspondent in Philadelphia, that the Pear was grown in that neighbourhood, sixty years ago, by a person named JACOB WEISS, who obtained the tree, with many others, at a settlement of Swedes, which was early established near Philadelphia, where Mr. WEISS had built a house. The Judge suggested the probability of Mr. WEISS, and the father, or grandfather of Mr. SECKLE, having been intimate, as both families were Germans, and of that rank in society which might be likely to lead to such an acquaintance. The conjecture,

therefore, is, that under such circumstances, Mr. Seckle's family obtained grafts from Mr. Weiss's tree.

Mr. Coxe, in his *View of the Cultivation of Fruit Trees in America*,* (an interesting volume, which I have forwarded to the Society), after assigning the same origin as I have stated in the beginning of this letter, describes the fruit thus: "The form and appearance vary with aspect, age, and cultivation; the size generally is small, the form regular, round at the blossom end, diminishing with a gentle swell towards the stem, which is rather short and thick; the skin is sometimes yellow, with a bright red cheek, and smooth, at other times a perfect russet, without any blush. The flesh is melting, juicy, and most exquisitely and delicately flavoured. The time of ripening is from the end of August to the middle of October. The tree is singularly vigorous and beautiful, of great regularity of growth, and richness of foliage, very hardy, and possessing all the characteristics of a new variety. Neither Rozier or De la Quintinye, among the French, nor Miller or Forsyth among the English writers, describe such a Pear as the Seckle; nor have I found one among the intelligent French gentlemen in our country who has any knowledge of it in his own."

I may add to the above, that the fruit is admitted by all, to be one of the most exquisitely and highly flavoured we possess. Its flavour is very peculiar, having a factitious aromatic perfume, rather than the natural odour or taste of fruits. The late General Moreau informed me, that he had never tasted this fruit in France, the country in which, of all others, the finest Pears are cultivated.

* Page 189.

That I may make this description as complete as possible, I inclose a very correct drawing of the Pear, which I have obtained from Mr. Coxe, excuted by his daughter, Mrs. M'Murtrie. This you will also have the goodness to present, in my name, to the Society, and I trust they will consider it worthy a place in their *Transactions*.

With the best wishes for the prosperity of your Institution,

I remain, dear Sir,

your's respectfully,

David Hosack.

New York, Oct. 28, 1818.

The Seckle Pear.

LI. *Upon the Preservation of* Fruits from Wasps. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read February 2, 1819.

The depredations committed by wasps are so extensive, and the best means which the gardener can employ in defence of his fruit, are generally so inefficient, that I have thought the following communication worth transmitting to the Horticultural Society; though my observations have been limited to a single situation.

It has always been the custom at Downton, to reserve the principal part of the crop of Grapes in the vinery, till late in the autumn, and much attention has consequently been found necessary, to defend it from wasps. Blinds of Scotch gauze were used with tolerably good success; but a few wasps usually found means to get in, and having once entered, they liked their habitation so well, that they never again quitted it. It was also found difficult to obtain at all times, in calm and damp weather, a sufficient degree of ventilation; and if Grapes at any time indicate a disposition to become mouldy, there is much difficulty in the subsequent preservation of them.

About ten years ago, the wasps ceased to pay any attention to my Grapes; and subsequently they have not done the least damage, though the lights have been constantly open during the whole of every dry day, after the Grapes have become ripe. In the summer of 1815, the nests of wasps were so numerous, that after a vast number had been destroyed by my people, and an equal

number, at least, by a numerous colony of badgers in the vicinity, there remained nearly a nest to every acre of ground. Nevertheless I could not discover, though I almost every day minutely examined the house, that the least damage was ever done by wasps; and my gardener is perfectly confident, that not a single Grape was broken.

I am not acquainted with any circumstance to which I can, in any degree, attribute the singular indifference of the wasps to my Grapes, at the period above-mentioned, except that at the same period a numerous plantation of young Yew trees, which nearly surround the house, first began to bear fruit. These have subsequently produced, in every season, an abundant crop of berries, upon which the wasps have preyed with much avidity, apparently preferring the fruit of the Yew tree to that of the Vine. The taste of the Yew berry indicates the presence of much saccharine matter, which is mixed with mucilage in a very concentrated state: and it is therefore probably very nutritious.

In the year 1815, and in several other seasons within the period above-mentioned, the fruit in my garden (which is about three hundred yards distant from my vinery) was nearly all destroyed by wasps: and it becomes rather an interesting question, whether, if that had been as nearly surrounded with bearing Yew trees, as the vinery was, my fruit would have been destroyed. I can scarcely flatter myself that it would have wholly escaped; but I entertain little doubt but that the attention of the depredators would have been much divided; which, in a vicinity containing but one fruit garden, is a circumstance deserving some consideration. Neither my garden, nor its immediate neigh-

bourhood, at present contains a single female Yew tree; but as it is a tree, which is admirably calculated to afford shelter, I propose to plant a large number as soon as practicable, intermixing about one male with six female plants.

The Yew tree is capable of being propagated by large cuttings, and of course by layers; and the number of trees of any variety may be increased by grafting; and I entertain no doubt by budding, the bud being inserted without having its wood taken out. I have reason to believe that some advantage may be obtained by selecting a good variety; for I have observed that the wasps prefer the fruit of one of my trees to that of every other, probably owing to its being sweeter, or better flavoured; but my palate is not sufficiently subtile to enable me to distinguish the difference.

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LII. *Observations on the Formation of a Select Collection of* Apple Trees, *with an Account and Description of* four new Seedling Dessert Apples. *By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read January 5, 1819.

Several seedling Apples of considerable merit having been exhibited at the Meetings of the Horticultural Society during the last season, I have selected four of them, which appear to me to deserve particular notice in the *Transactions* of the Society, because they may probably hereafter be considered of sufficient value to form part of every good collection.

Those persons who have witnessed the great variety of Apples which were shewn to the Society during the last six months, may think, perhaps, that any addition to the stock of this fruit is not necessary; and that it requires reduction, rather than increase. In the propriety of this opinion I fully concur; and I consider that one of the chief points to which the attention of the Society is at present directed, is the effecting that object, by forming a list of those Apples, whose value is well ascertained, and encouraging the cultivation and distribution of those alone.

Of the many sorts of Apples which we daily observe in the fruit shops and on the stalls in the metropolis, the quality is so inferior, as to excite surprise that they are purchased; and in the smaller towns and villages of the kingdom, as far

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as my observation has extended, the Apples which are there exposed to sale, are even worse. This defect is, in part, to be attributed to the carelessness and ignorance of some of the first cultivators of the trees, from which such fruit is obtained; but chiefly, to the want of the distribution, through the kingdom, of really valuable grafts. Good fruit may be as easily grown as bad, and it cannot be supposed, that if scions of better varieties could be readily obtained, they would not be preferred.

In the classification of Apples, the first division is into those for Culinary Purposes, and those for the Dessert.

The Kitchen Apples, as we call them, form the most important class; in productive years they afford a considerable portion of food to the lower and middle orders of the people; it is in this class that the defects I have noticed, are more particularly observable. The cottager's garden and the farmer's orchard furnish plenty of these, generally taken from some seedling, accidentally raised in the neighbourhood, and worked for want of a better kind, though deficient in several essential qualities.

The number of this class of Apples to be selected for cultivation should be few, just sufficient to keep up, according as they come in season, a successive supply through the year. The trees should be hardy, free growers, prolific in produce, and their bloom not liable to be injured by frost; the fruit should be large, weighty, and filled up in the core, with a pulp well flavoured and juicy, sufficiently saccharine, yet possessing some acid, and becoming soft when dressed. Twenty sorts, with such properties, may readily be selected from the kinds we now know, and that number

is sufficient for every purpose required; if better ones be hereafter raised or discovered, they should be substituted for the least valuable in the original selection.

Of trees for the supply of the dessert with Apples, a larger stock will be required; perhaps to the extent of fifty or sixty sorts. There are many reasons for extending the number of our Dessert beyond that of our Kitchen Apples. The difference in flavour is much more perceptible when the fruit is in a raw state, than when it is dressed, consequently a greater gradation of that quality alone will be required. The taste of individual counsumers of fruit varies so considerably, as to occasion particular sorts to be preferred by one person, which are but little esteemed by another. The necessity also of having a variety of eating Apples in use at one time, makes it expedient to cultivate several kinds, which come in season together, whereas one, or or at most two sorts of Kitchen Apples are sufficient for the supply of any particular period.

In forming a collection of Dessert Apple trees, it will be impossible to confine our choice to those which are hardy and productive; for if these two properties are considered essential, some of our very best verieties must be rejected. By a diligent collection of the existing good kinds, which have not been brought into general notice, and by the careful production of new plants, on the principles and plans recommended by the President, we may probably make much improvement in a few years. Too many of our richest and best Apples are produced by trees which are suffering, under the debilities of age, or from a weakness of constitution, which, in younger trees, under the influence of a

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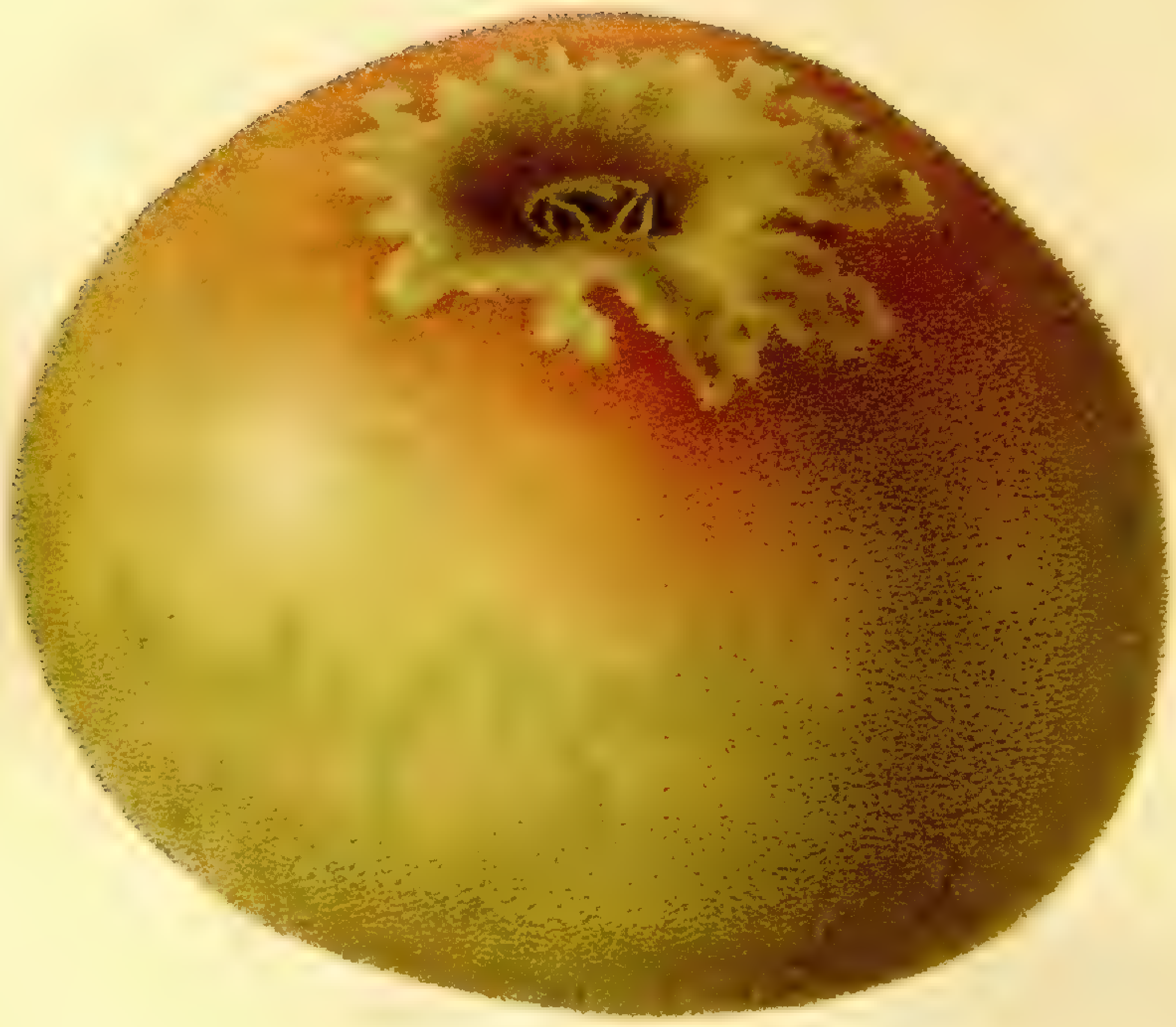

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1. *The Breedon Pippin.* 2. *The Lamb Abbey Pearmain.*

3. *The Braddick Nonpareil* 4. *The Pitmaston Russet Nonpareil.*

series of wet and cold summers, has brought on disease and decay, equally destructive, as the operation of time on the older plants.

Thus it appears, that though our orchards and gardens may be said to possess sufficient varieties of the Apple for the use of the kitchen, yet new sorts for the table may still be considered as wanted, and those of superior quality ought to be eagerly sought after.

The *four new varieties* which I shall now proceed to describe, as possessing very considerable merit, are all of the class of Apples for the table. Mr. Hooker's excellent figures of them, will probably convey a more perfect idea of their appearance, than my descriptions.

The first is the ***Pitmaston Russet Nonpareil.*** It was raised by John Williams, Esq. at Pitmaston, near Worcester, to whose abilities, as a scientific Gardener, the printed and written records of the Society, in its Transactions and Correspondence, bear ample testimony. This tree is a seedling from the Nonpareil, and has been in bearing the last four years. The wood and colour of the bark have a strong resemblance to its parent, but the extremity of the leaf is not so sharply pointed. Its blossoms appear to be hardy. The fruit was exhibited and tasted at the Meetings of the Society on the 20th of October, and the 17th of November last. In general appearance, this apple is not unlike Padley's Pippin. It is flatly compressed, rather narrowest at the head; near three inches in its widest, and half an inch less in its shortest diameter; the eye rather open, inserted in a broad shallow cavity, surrounded by slight irregular plaits; the skin is of a dull green, nearly covered with russet, a little mixed with

yellow, and faint red on the sunny side; the glands on the surface become dark, some of them quite black; the stalk is short, and not deeply inserted; the flesh is greenish, rather more inclined to yellow than that of the Nonpareil, and will probably become more yellow as the tree advances in age; it is of a pleasant consistence and rich flavour, highly charged with the peculiar aromatic perfume, which is the characteristic of the Nonpareil.

The second Apple I propose to call the *Braddick Nonpareil.* It was raised from a kernel by our active and zealous Member, JOHN BRADDICK, Esq. in his garden at Thames Ditton. The Apple was tasted at the Meetings of the Society of the 20th of October, and the 3d of November last, and specimens have kept to the present time, perfectly sound and firm. In shape, it is flattened-globular, being three inches in its widest, and two inches and a half in its shortest diameter, not much lessened near the eye, and nearly flat at the stalk; the eye rather small, inserted in a somewhat deep and nicely rounded cavity, almost without plait or wrinkle; the skin is smooth, greenish near the stalk, becoming tinted with yellowish brown, and a considerable portion of brownish red on the part exposed to the sun; most of the specimens had a patch of fine russet round the eye; the stalk is short and not deeply inserted; the flesh yellowish, sweeter and more melting than the Nonpareil, though not very soft, richly sugared, and slightly aromatic.

The *Breedon Pippin* is the third. It was raised from a kernel, sown with the Pommace, when some cyder was made, about eighteen years ago, by the Rev. JOHN SYMONDS BREEDON, D. D. at Bere Court, near Pangbourn, in Berk-

shire. The tree is now about twenty feet high, with a spreading head extending twenty-seven feet on one side, and eighteen on the other; this difference is owing to its having been lopped. It has a smooth straight stem, seven feet long, measuring twenty-six inches in circumference, at five feet from the ground. It has been rather a shy bearer, but it bore three bushels of fruit in 1813, and four bushels in the last season. Specimens were sent to the Society by William Kent, Esq. on the 3d of November last; it will keep sound till after Christmas, and is well adapted for a late supply for the dessert. It much resembles the Court of Wick Pippin, though it is a superior fruit; but it is larger and broader in proportion to its length. It is flatly-conical, with an inclination to square, especially near the eye; its diameters measure two inches and three quarters, and two inches and a quarter; the head is much flattened and irregular, and the eye is inserted in a broad and shallow cavity, amidst plaits and wrinkles variously formed; the opposite end is also flat and broader than the head; the skin is of a deep, rather dull yellow, tinted on the part exposed to the sun with reddish orange, a little inclining to a rich russet, as in the Court of Wick Pippin; stalk long, inserted in a regular and well hollowed cavity; flesh yellowish, firm, very sweet, with a rich vinous acid, a little spicy and having a flavour something resembling that of a Pine; it is rather dry, but this defect will probably diminish with age.

The *Lamb Abbey Pearmain* is the fourth. It was raised by Mrs. Malcolm, the Lady of Neill Malcolm, Esq. of Lamb Abbey, in Kent, from the seed of an imported fruit

of the Newtown Pippin. The tree is one of five, which were raised from the seeds of the same Apple, all varying from each other, and this, in an especial manner, from its parent. The tree is fifteen years old; at the age of six years it produced three Apples, at nine years old, seven dozen, and from that period to the present time, it has regularly borne good crops. It possesses a defect, however, which will make it expedient to treat it as an espalier; the branches are so unusually slender, that they constantly break, when the fruit is on them. The Apple was exhibited at the Meeting of the Society of the 15th of December, and seems well adapted for keeping. Its general appearance is much like a well formed Pearmain, though more highly coloured. It is oval, and somewhat pyramidal, rather flattened at both ends; three inches high, by two inches and three quarters wide; the eye small, sunk in a deep and broad cavity surrounded by regular but slight plaits, which do not extend to the body of the fruit; stalk short and deeply inserted; skin yellowish green on the shaded side, and next the eye, the sunny side being covered with a handsome red, having many black spots, in the manner of an ordinary Golden Reinette. Flesh yellowish next the skin, green next the core, firm, crisp, and very juicy, with a peculiar rich sweetness, and a slight aromatic flavour.

From the present appearances of these four Apples, I am inclined to think that they will continue of the first class in estimation; but it will not always happen that the produce, however promising, of a seedling, will retain its excellence; some must be expected to fail, while others

will improve. It has been observed, that firm seedling Apples appear to improve with age, but soft mealy fruit deteriorates, as the trees grow older.

The observations I have made in the first part of this Paper, on the propriety and expediency of forming a very reduced list of Apples for general use, must not be considered as tending to a sudden selection of kinds, for that purpose. I conceive that, in order to produce a result which will be really useful, and generally satisfactory, every kind of Apple which has acquired celebrity, or even a settled name, either in the provinces, or in the vicinity of London, should be submitted to comparison and observation, not only on the table of the Society, but in cultivation in a garden, together. The first consequence of such a proceeding, will be a considerable reduction of the numbers of the Catalogue, for we shall find the same Apples not only from distant places, but even from contiguous stations, under various names; the synonyms of our nomenclature being thus ascertained with accuracy, will naturally facilitate the future labour in the selection, which must be a work of time and caution.

LIII. *Account of the* Species *and* Varieties *of the* Beets, *cultivated for Use. By Mr.* William Morgan, *F. H. S. Gardener to* Henry Browne, *Esq. at North Mimms Place, Hertfordshire.*

Read December 15, 1818.

The different sorts of *Beet* cultivated in gardens, for the table, or in fields for the use of cattle, originate from two distinct species of the Genus *Beta.* The Beta Vulgaris has produced those varieties of which the root only is used; and from the Beta Cicla have sprung those whose leaves are gathered for culinary purposes. Both species are biennials, and are natives of the south of Europe; with us they have gone under the general denomination of Beet, but the French have distinguished the first kinds by the name of *Bette-rave*, and the others are called by them *Poirée.*

More attention has apparently been paid to these plants in foreign countries than in England; this I discovered by observations on the plants raised from a collection of seeds which were imported by the Horticultural Society, in the spring of 1817, and distributed to its Members; some of each of these were grown by me at North Mimms Place, last year; I prepared notes on them, for the use of the Society, but deferred presenting them in consequence of information which Mr. Sabine obtained, relative to the plants, from M. Vilmorin of Paris, which made me desirous of seeing the varieties again under cultivation; this I have been

enabled to do very satisfactorily in the present year, in the garden of the Society at Kensington, where all the sorts, of which seeds could be obtained in England and from France, were grown most successfully.

The different sorts of rooted Beets, the cultivated offspring of the Beta Vulgaris, must necessarily be divided into those for garden, and those for field cultivation. I shall first notice the garden kinds.

The first I call the ***Large Rooted Red Beet;*** it is the ***Betterave Rouge Grosse*** of the French. The root usually grows more than half out of the ground, but occasionally it buries itself deeper; the leaves grow erect on foot-stalks near a foot long; these, and the veins of the leaves, are of a deep red colour; the leaves themselves are of a lurid green, more or less inclining to lurid purple; they are heart-shaped, and of considerable size, the large ones measuring from nine to twelve inches in length, and from seven to ten inches in width; the smaller leaves springing from the centre of the crown of the root are not numerous; the root is more than a foot long, ending in several strong fangs; it is of the same thickness throughout, measuring about four or five inches in diameter; the internal colour is a bright red, shewing white concentric rings when cut transversely. This sort usually boils soft, of a bright pink colour, exhibiting the white rings, and has a good sweet flavour: but it is sometimes coarse, and its size renders it rather incommodious for use. In habit it approaches the Mangel Wurzel.

The second sort comes from the English gardens only, where it is called the ***Long Rooted Red Beet.*** A very small part of the root of this appears above ground; the leaves

are of different lengths, and spreading; the outer ones grow on foot-stalks about nine inches long, the inner ones are numerous in the centre, and very short, forming as it were, a rose of leaves on the crown of the root; the foot-stalks and veins are crimson, more rounded than those of the preceding, and of a very dark shining lurid purple; the root tapers like a Carrot, and in good ground attains the length of fifteen or eighteen inches, throwing out strong fibres, but no fangs; the top of the root generally exceeds three inches in diameter; its colour is bright scarlet; the concentric rings are perceptible in the root when it is cut, but they are not white. When boiled, the colour is a deep pink, often darker, exhibiting large rings; it is sweet, but sometimes earthy, and is very apt to be stringy, and therefore, not so worthy of cultivation, as some others.

The third sort is the *Dwarf Red Beet;* it is the variety most cultivated in the Royal Gardens at Kew. It has a strong resemblance, in many points, to the preceding, but is a preferable kind. The root grows within the ground; the leaves in habit are similar to those of the second sort, but they are smaller, less numerous, and grow on shorter foot-stalks, the outer ones not exceeding four inches in length; the colour of the leaves is as deep or deeper than that of the second sort, but it is less shining, and the footstalks and veins are darker; the root tapers to the length of twelve inches, and bears only very fine fibres, differing in this respect from the preceding; the diameter at the top is about three inches; its colour is crimson, shewing rings, but very slightly. It boils of a deep pink, is tender, and perfectly free from all stringiness.

The fourth sort, the *Bette-rave Rouge Ronde Précoce* of the French, is not very common in the English gardens, but it is sometimes cultivated under the name of the *Turnep-rooted Red Beet.* The produce of French seeds was the best. This is cultivated on account of its early maturity, being fit for use before the long-rooted sorts, and it is recommended for shallow soils, in which the long roots of the other kinds never form well. Its root grows principally within the earth, but the broad surface of the top is exposed to view, and looks rough and brown; the leaves are expanded, spreading out widely, they are not numerous, those in the centre being short and small; the footstalks of the outer ones are from five to six inches long, of a pale colour, tinged or striped with purple; the nerves of the leaves are whitish, and are tinged in like manner, as the footstalks; the leaves themselves are of a shining green, having the appearance of a purple stain, the effect of the colour in the veins; the diameter of the root, at the top, is near five inches, and it is not more in length, tapering very suddenly, and throwing out a few strong fibres, but no fangs; its colour is a purplish red, the rings are lighter, and though they are concentric, they are not circular, but very irregular; the rings and parts of the root are sometimes white, which is a defect; the lamina of the root which constitute these rings, are very thick. The root boils of a pink colour, is coarse in appearance, but early in the season is certainly better flavoured than the other kinds; it is tender, and free from fibres.

The fifth kind was obtained from France under the name of the *Petite Bette-rave Rouge*, and is of considerable value. The root grows within the ground; the leaves are upright,

numerous and small in the centre; the outer footstalks are six or seven inches long, those and the nerves are of a deep red, and the leaves themselves, which are short and roundish, are of a dark lurid purple, and very shining; the root in the widest part is little more than two inches in diameter, and is shaped much like a carrot of that dimension; it grows regularly, has no fangs, but only fibres; the flesh of the root is of a much deeper crimson than that of any yet noticed, and does not exhibit the marks of rings distinctly. It boils of a deep colour, and is very tender and delicate. This has been mistaken for the Red Beet of Castelnaudàri, which, from the specimens of it that have been produced this year, in the garden of the Society, is certainly quite different.

The sixth variety of the Red Beet, is *the Bette-rave Rouge de Catelnaudari;* it is so called from a town in the province of Languedoc in France, where the soil is peculiarly adapted to the growth of these vegetables, and where this variety, which is so much esteemed by the French for its superior flavour, which they compare to that of a nut, was originally produced. The root grows within the earth; the leaves are thickly clustered round the crown, spreading on the ground; the longest of the footstalks does not exceed three inches; these, and the veins of the leaves, are quite purple, whilst the leaves themselves are green, having only a slight stain of purple, which proceeds from the borders of the veins; the root is little more than two inches in diameter at the top, tapering gradually to the length of nine inches, and is covered with fibres of different sizes; it is of a deep purple colour, exhibiting dark rings. It preserves its fine colour when

boiled, is very tender and sweet, and looks delicate when sliced. This is certainly more distinct, as a variety, than any of the others; it is smaller in its whole habit, and as it occupies much less space in the ground, may be sown closer than the other kinds usually are. It is also stated by the French writers to be fit for use early in the autumn.

The variation in the intensity of the colour in the Red Beets is considerable, and the foliage is equally liable to show differences; but the descriptions now given must be taken as the true characters of each sort, and whenever differences are observed to arise amongst plants, raised from one kind of seed, those which do not agree therewith must be considered as deviations from the true sort.

In addition to the above six kinds of Red Beet, I received from Edinburgh seeds of the *Green-topped Red Beet*, but as they did not succeed, I am not able, from my own observation, to describe the variety. It was formerly used in the gardens round London, and is now much grown in Scotland, where it is preferred by some of the best gardeners. Its growth and habit much resemble the Dwarf Red Beet; its leaves are green, not bright, but rather a dull purplish green, as I am informed.

Of yellow-rooted Beets there are two kinds. *The Large Yellow Beet*, the *Bette-rave Jaune* of the French, is the first. In habit and appearance, with the exception of its colour, it has a great resemblance to the Bette-rave Rouge Grosse, though it is not perhaps quite so strong and large; it grows mostly above the ground, the footstalks of the leaves and the veins, have a strong bright yellow tinge, and the leaves

themselves are of a dark lurid green, without any admixture of red; sometimes the colour of the footstalks and veins shews itself of a dark orange; the outside of the root is a pale orange, the inside is a lemon colour; when boiled, the whole becomes paler, and the transverse slices shew the rings, as in the red kinds; the lamina forming the rings are very large. The flesh is particularly sweet and tender, but from the size of the root is rather coarse, a defect from which the next kind is free.

The Small Yellow Beet, or ***Bette-rave Jaune de Catelnaudari,*** was raised from some of the seeds received from Messrs. WHITLEY and Co. as well as from France, where, it originated. The whole appearance of the plant is exactly like that of the Bette-rave Rouge de Castelnaudari, except that it has no red colour about it. It grows entirely in the ground; the leaves spread on the surface, the outside ones being on footstalks about four inches long; the inner ones are shorter, numerous, of a dark green colour, and rather waved on the edges; the footstalks are green rather than yellow; the root is near three inches in diameter at the top, and extends about eight inches into the ground, putting out strong forks, with fibres attached to them; it is very similar to the other yellow kind, except in size, and its rings are consequently less coarse; in colour it exactly corresponds. When boiled it is tender, yet firm, and very sweet, being unquestionably, the most preferable variety which can be grown for the table, though its colour is not so agreeable to the eye.

M. VILMORIN, in his reply to some enquiries made by Mr. SABINE last winter, relative to the Beets cultivated

in France, mentions that he once possessed a yellow rooted sort, which he received from Castlenaudari, that was quite round, but that it was accidentally lost.

It was from the Betterave Jaune Grosse that the French, during the late wars, when they were excluded from the trade of the West India Islands, principally manufactured sugar; and from this circumstance it is sometimes found under the name of *Bette-rave Jaune à Sucre.*

All the varieties, both of the Red and Yellow Beets, which I have described, are applicable to the same purposes for the table, and the selection of the sorts for cultivation will depend much on the fancy of the gardener. The sweet flavour in the root is the object to be attained for the table; and that seems to depend much on the soil, for the best sorts will taste earthy in particular gardens, where inferior kinds are not so. With us the roots are usually boiled for our autumn and winter sallads; by the French they are generally baked, or roasted in wood ashes, for the same use, and these modes of dressing them are thought to improve their flavour; when baked, it is necessary to cover the roots with paste, to preserve their moisture; but this is not required when they are roasted, for the ashes covering them, stop the too great evaporation of their juices.

The cultivation of Beets is too well known to need particular detail. They require a deep and rich soil, to prevent their growing forked; and being impatient of frost, must not be sown till all danger of destruction from that, is over; they succeed best in drills, but are commonly sown broad-cast. Before the winter, they must be taken out of the ground, (their leaves may be trimmed, but must not be cut off,) and

laid up in a store-room or cellar, secured from frost. As all the varieties sport extremely, particular care will be required in the selection of roots from whence seeds are to be saved; these must be carefully chosen true of their sorts, and planted out separately in the succeeding spring, when they will throw up their flowering stem, and bear an abundant crop of seeds.

The large rooted varieties, which with us have been entirely grown for feeding cattle, particularly cows, have by the French and Germans been also used in the manufacture of sugar, by extracting the saccharine matter from the roots, though the large yellow kind before noticed was, I understand, the sort principally used. All the varieties contain a great portion of sugar, and the large sorts are perhaps only preferred for this purpose, because of the greater mass and weight of root, which a given quantity of land produces. The large varieties are not suited to the table, they have little flavour, and are of a very coarse substance.

The well known kind, called here *Mangel Wurzel*, or *Root of Scarcity*, and by the French *Bette-rave Champêtre, Racine de Disette*, or *Racine d'Abondance*, was introduced into this country, from Germany, in 1786; seeds were sent from Mentz in that year, by THOMAS BOOTHBY PARKYNS, Esq. to Sir RICHARD JEBB, for the Society of Arts; some of these were obtained by JOHN COAKLEY LETTSOM, M. D. who having paid much attention to their cultivation, obtained a further supply of seeds from France, and extensively distributed them. The plant had become known in France about two years previous to this period; and a treatise on its cultivation had been printed by the Abbé de COMMERELL; a

translation of this was published by Dr. LETTSOM in 1787, which went through three Editions in the same year, and thus the Mangel Wurzel became very generally known. In Germany it is called ***Mangolt*** (Beet) ***Wurzel*** (Root); the first of these words was, by mistake of the French writer above named, written ***Mangel*** (Scarcity, ***Disette***), and hence it erroneously received its present appellation. From its property of growing with a large portion of its root above ground, it is also called by the French, ***Bette-rave Sur-terre***, or *Hors-de-terre*. In a favourable soil, and with good attention, it attains a great size. Its leaves are large and numerous, with long green footstalks, the bases of which are more or less tinged with red; The roots generally grow two thirds out of the ground; they are cylindrical, tapering to the top, and bottom, with fibres, not fangs; about eighteen inches long and six inches in diameter in the centre; the flesh internally is sometimes quite white, sometimes variegated in circles with crimson or rose and white; in the first case, that is when the flesh is white, externally they are a deep salmon colour; in the latter case, the outside has more of a crimson hue. This kind of Mangel Wurzel has long been cultivated with great success and advantage by the Marquess of SALISBURY, at Hatfield; and the plants raised from the Hatfield seeds were certainly the best.

There is a sort of Mangel Wurzel which I have not seen in this country, but which is sometimes grown in France; it is much inferior in all its properties. Its root grows in the ground in shape like a Swedish Turnep, with strong fangs, from five to six inches in diameter at top; its colour varies as in the other; it

has more leaves, and they are dwarfer and more spreading. To distinguish this and the preceding sort from the next, the French call them *La Disette Rouge, ou Rose.*

The *Bette-rave Grosse Blanche de Prusse,* or *La Disette Blanche,* is not grown in England, but it is raised in Germany; its root both externally and internally is white. Its name explains that it came from Prussia. The first notice I had of it was in M. VILMORIN's Catalogue of seeds, and being one of the sorts sent to the Horticultural Society by him last spring, it was grown in their garden. The root grows below the ground; it is very fibrous, carrot-shaped, but sometimes swollen in the centre, about ten inches long, and five or six inches in diameter in its widest part; the coat of the root is greenish where exposed to the air; the leaves are dwarf and spreading; they are green without tinge of other colour. This seems a very inferior sort for agricultural purposes; it may, however, be hardier, and stand weather better, and perhaps yield good sugar. A Beet with a white edible root, is mentioned in some gardening books, probably this is what is meant, but as it is earthy, stringy, and coarse, it cannot be recommended.

The cultivation of the large-rooted Beets belonging exclusively to Agriculture, it is unnecessary to notice it in this place; but I cannot avoid expressing my surprise that no fair trial, on a large scale, seems to have been made in this country with the Yellow Beet, for farming purposes. There can be no doubt that it possesses nutritive properties, superior to those of the Mangel Wurzel, or any varieties of the Red Beet; its firm substance and strong saccharine juice give it this advantage; and I am inclined to think, from its habit and

appearance, that it is more capable of enduring hard weather. The best Mangel Wurzel exceeds it in size, but if the same pains had been taken in procuring seeds from selected plants of the Yellow Beet, as have been taken with the other, it is probable, that equal success would have attended the experiment, and that we should now have had a Yellow Beet for field cultivation, as large as the Mangel Wurzel.*

The *Beta Cicla,* or *White Beet* and *Green Beet,* of the English gardens, (the *Poirée* of the French), is only cultivated for the sake of its leaves; the roots, though strong, have no substantial part which can be converted to useful purposes; where they are solid they are hard, and they are usually much divided and forked.

The French use the thin part of the leaves sometimes to mix with Sorrel, the acidity of which it corrects; with us it is dressed as a substitute for Spinach, which it resembles, though it is certainly much inferior to it in flavour. The leaves of many of the varieties of the Beta vulgaris have a Spinach-like flavour, but not so good as those of the Beta cicla. The stalks of the leaves of the Beta cicla when peeled, are also used for culinary purposes, they are usually boiled and served up in the manner of Asparagus, or Sea Kale,

* On the same day that this Paper was read to the Society, John Braddick, Esq. exhibited three roots of the large Yellow Beet, grown by him at Thames Ditton, which fully evinced the justness of this opinion; one of the roots weighed twenty pounds, and the three together weighed fifty-two pounds. They were as large as any root of Mangel Wurzel which I have observed this year, and seemed particularly sound.

and are sometimes stewed with sauce like Celery. The entire leaf is also frequently employed in the composition of soups.

Besides the common sort called both *White Beet* and *Green Beet,* there are some varieties which I shall also describe. The cause of the use of the terms *White* and *Green,* as applied to this plant, is the variation in the colour of the leaf-stalks, and of the leaves themselves, in different plants; but it is not of sufficient importance to create a distinction in cultivation; in fact, these variations arise from the same seed, which will in all cases produce plants considerably differing from each other, not only in the colour, but also in the size and shape, of the leaves; but I think that in all, the footstalks and veins have rather a paler colour than the generality of plants possess. The leaves of this common sort spread wide over the ground, and do not rise high.

The French have given the name of *Poirée à Carde* or *Cardes* to some improved varieties of the Beta cicla, and hence has originated the appellation of *Cardes,* which is to be found in some of our gardening books, applied to this vegetable. There are three kinds of *Poirée à Carde,* viz. *Blanche, Jaune,* and *Rouge;* but these have no difference in their qualities; the leaves and stalks of all being similar in flavour when dressed, the advantage they possess over the common sort is in the superior size of the foliage, and the thickness and fleshiness of the stalks; they are upright, and not expanding, and are much more vigorous in habit, but they appear to be of a more tender nature, and less capable of resisting frost. I have not seen the Yellow Poirée à Carde. The Red or Rose variety has grown this year in the garden of the

Horticultural Society, from seeds which were received from Mr. Lee, of Hammersmith, under the name of *Striped Beet;* the stalks and veins of its leaves are stained with a most beautiful and brilliant deep lake, or crimson colour. The White variety was also grown in the Society's garden this year, from seeds presented by Sir Samuel Young, under the denomination of *Bléte,* or *Mangold Kraut.** He found it used as a vegetable on the Banks of the Rhine, and in Switzerland, and has, I understand, cultivated it very much this season; he speaks highly of its merit, when dressed in the ways I have before mentioned.

The *Poirée Grosse Blanche,* which came from France last year, with the other Beet seeds, has some resemblance to the Poirée à Carde Blanche; but it does not grow so upright, nor are its leaves so long; the stalks are pure white, broader and shorter, and seem to have more substance than any of the other varieties.

The varieties of the Beta cicla should be sown late in the spring, and must have a rich soil, to enable them to produce the leaves large and good: they require no particular care, except that of being kept sufficiently thin, and distinct from each other in the beds. Those that remain

* Kraut is the general denomination in German of any Vegetable; Mangold Kraut, therefore means a Beet, the leaves of which are used as a vegetable. Bléte is the name given in some parts of Germany, as well as in some parts of France, to the Beta cicla, but is not admitted as a correct appellation by the regular Gardeners; nor indeed could it be so with any propriety, since the true application of the French word Bléte is to plants belonging to the genus Blitum, of which two species, the B. capitatum and B. virgatum are cultivated in our Gardens as ornamental annuals, under the name of Strawberry Spinach.

over the winter to produce early leaves in the spring, before they shoot up their flowering stems, must be protected from frost by some slight covering; for spring use the common sort, or perhaps the Poirée Grosse Blanche, should be selected. Those plants from whence seeds are to be obtained, especially the tender sorts, must be carefully sheltered during the winter.

LIV. *Some further Account of the Management of a* Stove for Tropical Plants, *in which the use of Tan is entirely laid aside; with Directions for the* Destruction of Insects *in a Hot-house. By* William Kent, *Esq. F. L. S. &c.*

Read February 2, 1819.

Having had the experience of two winters of the improved stove, since my former Paper upon it was communicated to the Horticultural Society,* I am now desirous of stating the result.

It will appear that I at first substituted saw-dust for tan, conceiving it would last longer, and not breed worms. In the first opinion I was correct, but I find that when the saw-dust becomes rotten, worms generate as freely in it as in the tan; both therefore are objectionable on this account. Besides which, when the pots are plunged, the roots of the plants run through the bottom, and over the tops of the pots, which always occasions a serious check to the plants, whenever they are removed, or require to be shifted.

The pots in my stove having stood on the surface of the saw-dust during the summer, I resolved to go through the second winter without plunging; with this view I entirely removed the saw-dust, and the apertures in the stone pavement, which had been left for draining the pit, were carefully stopped; the bottom was then covered with coarse sand, from six to eight inches deep, (cinder ashes might also answer), over this was raised a temporary boarded stage, on

* See Vol. ii. page 389.

which the pots were placed, and the state of the plants evidently proved the advantage of the change of system. As my stove was considerably enlarged last summer, by uniting to it one of my green houses, which has extended its length to forty-five feet, the pit reaches only half way; therefore my large plants are this present winter standing on the ground, without any heat whatever beneath them, either from tan or flues, and they are in perfect health. I think I can now, therefore, with certainty, pronounce that plunging is not only unnecessary, but really worse than useless, to plants, except where the roots have been injured and require to be drawn. If we reflect for a moment that in tropical countries, the stem, branches, and leaves receive a greater degree of heat from the atmosphere than the roots can possibly do, it appears extraordinary that a system of management so directly opposite to nature, should have ever been adopted, or that it should have been so long practised. If a quantity of earth was to be raised from the root of any tropical shrub, growing in its native situation, there is no doubt its heat would be below the temperature of the air; therefore the roots of the plants in a stove ought not, at any rate, to receive more warmth than their other parts.

Those plants which stand over the pit will require more water upon this new plan, than if they were plunged; the discretion and prudence with which this is applied is very important to the health of the plants. The water which drains from the pots on to the heated sand and the stones beneath, with an occasional supply poured into the pit, will raise a steam, that acts like dew, and evidently tends to the free and healthy growth of the plants, and also prevents that dry heat, which is most

commonly produced from flues, and which is destructive of the nutriment that the plants derive from the mould. Although this plan of a stove is not so good as that where steam is used, still it holds out many advantages superior to the old method.

There are, however, many other causes which facilitate the growth and preserve the health of plants, which the active and intelligent practical gardener will not overlook, more especially the destruction of insects. A vigorous state of growth can never be obtained, unless the plants are always kept clean, for which purpose, the occasional use of a hot-house engine will be found successful; when they are neglected, insects will increase rapidly; two of the most injurious of which are the Acarus, or Red Spider, and the Aphis, or Green Fly; these, notwithstanding the greatest care, will occasionally appear in stoves, but both may be readily destroyed, if attacked on their first appearance. For the Acarus, make a wash of quick lime, adding to it a quantity of sulphur vivum; with this, brush over the flues of the house; a fire rather stronger than usual should be kept up for a few days after the operation; the fumes will then be so effectual, that in a very short time scarcely any Acari will be found alive. The Aphides are easily killed, by burning tobacco in a chafing dish, provided it is done when they are in a young state; but it is expedient to have these remedies used before the plants can be injured by the attacks of the insects. As to the scaly insect, and mealy bug, when they are once perceptible to the eye, they can only be removed by picking off, or washing the leaves and branches with a spunge. When these different enemies of the Gardener are

neglected, and permitted to get full possession, the task of dispossessing them is no trifling one; but where the plants are attended to, and kept in health, the means I have recommended, with a little regular attention, will prevent their making any serious progress.

LV. *On the Causes of* Decay *in* Fruit Trees, *particularly* Apples. *In a Letter to the Secretary. By the Rev.* William Williamson, *Corresponding Member of the Horticultural Society.*

Read September 1, 1818.

Sir,

It may, perhaps, seem presumptuous in any one to advance other opinions concerning the decay of the Fruit Trees in our orchards, when so many experienced Horticulturists have expressed their decided conviction, that disease, brought on by old age, is the cause of their decline. But it must have occurred to those engaged in such pursuits, that there are many facts which cannot be reconciled to this theory. I have therefore sent the following remarks for the consideration of the Horticultural Society, in the hope, that if not just themselves, they may be the means of eliciting some new observations on the subject.

When we consider that the graft is but an extension of the parent stock, and therefore liable to all the diseases and defects of its original, and that most of our fruits have been cultivated by grafting during many years, it seems reasonable to conclude that they would, in common with every thing else that has life, arrive at that period when they would begin to decline, and at last totally fail. It was therefore recommended by several skilful Horticulturists to remedy this evil, by raising trees from the kernels of the

fruit, which having a renovated existence, would be free from these defects. This theory seemed so reasonable, that many were induced to adopt it, and so assured was I of its truth, that I began to raise trees in this manner, fully expecting, that though the fruit might not, possibly be so good, I should at least possess a tree free frome disease.

In the course of a few years, however, I was greatly disappointed, in finding that many of these young trees, some only twelve months old, began to exhibit the same diseases, and to be affected in a greater degree than many of our oldest varieties. It is therefore evident that old age is not the only cause of decay, but that probably, in young trees, it arises from some external cause, not connected with the plant itself; and I am induced to think that the great diminution of the ordinary warmth of our summer months, for some years past, is the principal cause of the premature decay which I have described.

They who are at all versed in gardening, especially in forcing, must be aware that there is something in the constitution of some plants, and even varieties of the same kind, which enables them to bear cold better than others, and that whenever the temperature is too low for the constitution of the plant, it becomes sickly and unhealthy in its appearance. Thus it is impossible to raise Melons and other exotics without the aid of artificial heat. We find also that some kinds of Peaches are much more tender than others. Why should the Apple Tree be an exception to this rule? May not the temperature of our summer months have lately become lower than the constitution of the tree will bear? We know that in Russia and America, where, though the

winters are more severe, the summers are hotter than with us, both moss and canker are, comparatively speaking, unknown on their Apple Trees. I am the more attached to this opinion, as it is found that this disease is not confined to Apple Trees alone, but that in Kent (to which County my observations have been chiefly directed), it is extending its ravages to the Pear, the Plum, and the Cherry.

I believe it is a received opinion, that, in general, improved varieties are less able to bear the cold than the original from whence they are derived, I find this observation is true with regard to the different varieties of bulbous roots; and indeed many of the iproved perennial flowers are much more impatient of cold than the more common sorts. Now all the trees raised from the kernels of the fruit will, most probably, be improved varieties of our native Crab, and therefore of a more tender constitution, and less able to endure the cold which has of late years generally prevailed during the summer months: hence then, the reason why so many of our seedling trees become diseased at so early an age.

It has also of late years been a very common practice with the growers of young Apple Trees to graft upon stocks raised from the seeds of Apples, instead of true Crab stocks. Stocks of this description, being often tender, have a most pernicious effect upon the future tree; for though the stock should be wholly covered by the soil, yet it must still suffer in the root, and thus produce the same effect in causing the decay of the branches.

It appears, then, that we have been accessory in pro-

ducing the very effect we were endeavouring to prevent; we have not only raised many tender varieties, but have grafted them upon stocks, which, it is highly probable, were also impatient of cold during vegetation, and thus the destruction of our trees has been doubly accelerated.

But though all the varieties are comparatively tender, yet some are much more so than others, and hence arises a very important branch of the Horticulturist's care, to select those which are the least liable to be affected by the vicissitudes of our variable climate. In supposing that want of summer heat is the principal cause of decay, I would by no means be understood to assert that it is the only one; I can easily conceive that other causes may combine to produce it, and both reason and analogy point out to us that old age must have its effect, and perhaps in some old varieties, it may be the only cause; that very weakness of constitution which is produced by culture in the one case, may be the consequence of age in the other.

My principal object in sending you this communication, is to prevent the too prevalent practice of destroying old orchard grounds on account of their diseased and unproductive state; if there be any truth in the preceding observations, this ought not to be solely attributed to the tree, but to the change of climate, arising, most probably, from local and accidental causes, and which will equally affect both the old and new varieties of fruit. Every person, therefore, ought to pause before he proceeds to destroy an orchard, merely because it does not bear. It is to be hoped that those genial summers which gladdened and warmed the hearts of

our ancestors, will again return, and we shall have the pleasure of again seeing our trees laden with fruit, and at the same time free from every kind of disease.

I have the honour to be,

your obedient humble servant,

WILLIAM WILLIAMSON.

Westbere, near Canterbury,
August 28, 1818.

P. S. *October* 10. Since the above was written, I have seen orchards, apparently worn out, starting into fresh vigour, and bearing large quantities of fruit, which, I have no doubt, has arisen from the superior warmth of the past summer.

LVI. *On* Coverings *for* Cucumber Frames. *By* Alexander Seton, *Esq. F. H. S.*

Read March 2, 1819.

Having adopted a kind of night *covering* for *Cucumber frames,* which is extremely efficacious, I think a description of it may produce some benefit; for, though I do not imagine that it will be found to deserve any credit on the score of novelty, being one of those simple contrivances which naturally suggest themselves to a person in the course of practice, yet, as I have not observed it in use, I conclude that it is either not generally known, or that the principles on which it is founded are not sufficiently attended to. It consists of a portable roof of thatch, and is made in the following manner. Place parallel to each other two strong laths, of a length a little exceeding that of the frame, as measured from back to front, and at a distance equal to its breadth, if not exceeding four feet; to these bind cross pieces at right angles, about a foot distant from one another, to the extent of the length of the frame so that the two first long pieces shall project a little beyond the extreme cross piece at each end. Over the frame, thus made, spread a mat, and over that bind a layer of straw, from three to six inches thick, according to the purpose for which the covering may be intended, beginning by a course across at one end, and making the subsequent courses to overlap it and one another successively, in

the manner of thatch. The projecting ends of the two long laths will serve as handles, whereby the covering may be easily and expeditiously moved on and off the frame by two persons, one at each end; nor will it be difficult for one person to remove or to place it, if two be not at hand. If the breadth of the frame exceed four feet, or perhaps if it reach that measure, it will be expedient to make two coverings, as they become weak and unwieldy if too large; and in cases where there is an extended range of frames or pits, which will require a number of them, about three feet will be the most convenient breadth.

It will appear evident that with this covering there are two principles which co-operate in maintaining heat with greater effect than with mats, or any other covering in common use; namely the preventing of its escape, through communication with the external cold, and of its absorption through the creation of vapour. As to the first, it is generally known, and confirmed by constant experience, that in a covering composed of any of those substances which are much subdivided, the interstices between the fibres or non-continuous parts being occupied by air, such as straw, hair or feathers, interrupt the communication of heat in a greater degree than those of a more compact texture, the weight and extent of surface in both being equal. Mats and most other substances which are commonly used for this purpose, being more compact than straw, any covering composed of them that can be conveniently used, is much thinner, and consequently the heat passing quickly through them by means of the contact of their particles, flies off rapidly at the outer side. Next, in consequence of the straw being arranged in

the manner of thatch, the water runs off from its surface, and its interior remains perfectly dry, so that there is no consumption of heat from the creation of vapour in those parts which are near the glass; whereas mats, cloth, and other similar coverings, become impregnated with moisture every night from dew, rain, or snow, and the evaporation which is thereby constantly generated, and greatly augmented by the contact of the warm glass, causes a vast and continued drain of heat. The first of these objects is attained by the usual method of strewing loose straw or hay over the mats; but this, which is so troublesome, as to be often neglected, or done in a slovenly manner with damp materials, does not in any degree promote the second; for this irregular covering does not prevent the water from penetrating to the mats, from which the refrigerating evaporation is the immediate consequence.

Besides these advantages, the thatch coverings are attended with less trouble than others, being moved off and on with one action, in a moment, and there is not that risk of breaking the glass, which arises from putting pieces of wood or bricks over the mats, to prevent them from being blown off, as is often done.

These coverings are not only well calculated for Cucumbers and Melons, but may be used with great advatage in preserving tender plants during the winter. A pit or frame earthed up all round, and covered with one of them, or with two or three, if needful, upon each other, in the nights, and during severe weather, will be completely impervious to frost; and I have no doubt that it will preserve plants of most kinds in a healthier state than a common green-house.

The Loquat.

LVII. *An Account of the* Cultivation *of the* Mespilus Japonica. *or* Lo-quat, *as a Fruit-bearing Tree, at Blithfield in Staffordshire. In a Letter to the* Secretary. *By the Right Honourable* William *Lord* Bagot, *F. L. S. &c.*

Read February 2, 1819.

Dear Sir,

About this time last year I received a letter from you (in the name of the Horticultural Society,) requesting me to send you some specimens of the *Lo-quat* in fruit. In my answer to that letter, I think I informed you that my fruiting plant had been moved into a larger pot, which when it is done, always prevents its flowering the same year. This autumn it had the most magnificent bloom I ever witnessed on any plant, but I am sorry to add, that the fruit which has set is dispersed all over the tree, and in no part are there above two together; it is, in consequence, a very great disappointment to me, that this year the branches are not more worthy the acceptance of the Society. The last time the plant fruited, I had twenty-one fruits on one branch, and nineteen upon another; one fruit this year, however, is much larger than any I have ever yet seen.

In your letter, you desire me to give you some information as to my mode of treating the Lo-quat. The plan I have usually followed has been to give it a *winter* (out of doors) during the months of July, August, and September, and about the middle of October to replace it in a very warm

situation in the tan. This summer, however, I was obliged to alter my mode; for, just at the moment, when I was going to put it out for its *winter*, it became covered with at least twenty bunches of the finest flowers possible; I was therefore obliged to let it remain where it was. The present year's treatment, therefore, is an ex ception to the former practice; under that, it usually breaks into flower about the end of December, and the fruit becomes ripe in March or April.

The last time my plant was in fruit, Sir WILLIAM COKE, who had resided many years in Ceylon, where he is at present, was with me at Blithfield; he told me that he was in the constant habit of eating very large quantities of the fruit daily in that island, but that he had never tasted any so good, and with so much flavour, as those produced in my garden.

My present bearing-tree I purchased of Mr. COLVILL, in the King's Road, about twelve or fourteen years ago, if I remember right, and it was then a very small plant; it is now seven feet and a half high, the circumference of the branches being twelve feet; the girth of the stem is six inches and a half.

I have many very fine young trees from seeds of my own, and think some of them, which are about six years old, and five and six feet high, are of sufficient age to begin bearing fruit the next season. I shall consequently force them for that purpose.

I remain,

Your faithful and obliged Servant,

BAGOT.

Blithfield, 31st August, 1818.

Note by the Secretary.

In 1813 ripe fruits of the Lo-quat were presented to the Horticultural Society by Lord BAGOT, and were exhibited at a General Meeting in the spring of that year; but from accidental circumstances, the particulars were omitted to be published in the *Transactions,* though the Minutes* of the proceedings of the Society, at that period, record the opinion entertained by the Council of the merit and value of this novel production of the garden.

The Mespilus Japonica is known as a native of Japan, and the southern parts of China; it is at present cultivated in many parts of the East Indies, as an edible fruit; our first knowledge of the plant was from KÆMPFER, who, in his *Amœnitates Exoticæ,*† published in 1712, noticed it as growing in Japan; and THUNBERG afterwards, in his *Flora Japonica,*‡ gave a more ample description of it. In Japan, it is called *Bywa,* and in China, *Lo-quat.* It was brought to Europe by the French, in 1784, and planted in the National Garden, at Paris, called the *Pépinière du Roule,* at that time under the direction of M. LEZERMES. It was first imported into England, from Canton, and placed in the Royal Gardens at Kew, under the auspices of Sir JOSEPH BANKS, in 1787, since which time it has been much propagated, and is now to be found in every good collection of exotics in the kingdom.

* "May 12th 1813. The silver medal was presented to the Right Honourable WILLIAM Lord BAGOT, for many fine specimens of the Mespilus Japonica in fruit, sent to the Society."

† Fasc. 5, page 800. ‡ Page 206.

In its native state it is a tree of some magnitude, and of great beauty, having thick branches, bearing very handsome, long, and large evergreen leaves, bright and shining above, and covered with slight down on the under surface; the inflorescence is produced in the latter end of the year, from the end of the branches, in large compound spikes; the flowers are closely placed on the spikes, and have a delicate agreeable scent, resembling that of the Hawthorn flower; the petals are similar, also, to that flower, but larger, and perfectly white; the calyx and peduncles are covered with rust-coloured down; the whole spike has a very handsome appearance, The fruit ripens early in the succeeding spring, and is described by THUNBERG, as of the size of a Cherry, with a sweet and acid flavour, somewhat resembling an Apple; KÆMPFER calls it vinous.

A plain engraving, published by Sir JOSEPH BANKS, in 1791, from a sketch by KÆMPFER* preserved in the British Museum, gives a representation of both the flowers and the fruit; of the latter eleven are figured on the spike, rather larger than ordinary Cherries, and not quite round. The section of a fruit, which is also given, shews five full grown seeds, but in this circumstance there is great variation, for KÆMPFER states, that each fruit contains three, four, five, or more seeds; and THUNBERG mentions that the number of the seeds is from one to five.

The Lo-quat has been variously cultivated with us, sometimes as a stove plant, sometimes as belonging to the conservatory, and it has also been exposed in the open air during the winter. A very fine plant stood for several years against

* Banks, Icon. Kæmpfer. tab. 18.

a south wall, between two stoves, in the Botanic Garden at Kew, but was destroyed by the severity of the winter of 1814. Though it may with care be kept in the open ground, I do not apprehend it will readily blow when so circumstanced, and it seems to require the heat of a stove to make it bear fruit. When in a conservatory, it occasionally puts forth its blossoms in spring, as well as in autumn.

A more particular detail of the progress and appearance of the fruit, as ripened by Lord Bagot, is necessary, especially as there seems some variation from what has been stated respecting this part of its economy in the East Indies. When the fruit is growing, the spike remains erect, but as the ripening advances it usually declines, and becomes at last quite pendant. The green fruit of each bunch exceed twenty, though seldom more than six to nine remain to become ripe. In the young fruit five loculaments, with the rudiments of seeds in each, are apparent ; but as it advances, the seeds all become abortive, except one, which occupies the whole centre, pressing to one side the membranes which at first regularly formed loculaments.

The shape of the fruit, when ripe, is oval, rather irregular, and generally widest at the head, somewhat resembling a small Apricot ; it is of a very delicate pale orange hue, spotted minutely and obscurely with white, partially tinted with faint red, or rather blush, and covered with a fine down ; the size is about one inch and a quarter by one inch, though when only two or three remain on a bunch, they are larger. Full two-thirds of the diameter of the fruit in its centre is occupied by the single kernel, which is oval, and covered with a thin dark shining skin, the flesh of it is white, solid, and

firm, in taste resembling an Apple kernel, but rather more bitter. The outer substance of the fruit is a soft pulpy pale yellow flesh, juicy, and having a sharp malic acid flavour, but not particularly sweet or rich.

Monsieur Ventenat, in his *Figures* (tab. 19.) *of the Plants of the Garden at Malmaison*, has given a coloured representation of the Mespilus Japonica in flower. Mr. Hooker's drawing of a branch in fruit, from one of the specimens sent by Lord Bagot to the Society, is a beautiful resemblance of it in that state.

LVIII. *On the Cultivation of the* Under-ground Onion. *In a Letter to the Secretary. By Mr.* John Maher, *F.H.S. Gardener to His Grace the Duke of* Norfolk, *at Arundel Castle.*

Read November 3, 1818.

Sir,

I have the honour to send, for the inspection of the Horticultural Society,some samples of the *Under-ground Onion*, at present not so generally cultivated as it deserves; for when, in consequence of unfavourable seasons, the seed of the Common Onion cannot be depended on, the Under-ground Onions are always certain to produce a crop. In February last, I planted sixty of these Onions, and on the eleventh of July, I took up from them eighteen score. A single bulb, which was pulled up by mistake, shortly after it had shot up, had attached to it, thirty-seven rudiments of bulbs.

My method of cultivating the Under-ground Onion is as follows; as early in the spring, as the weather will permit, I prepare a piece of ground by digging and dunging it well; this is formed into beds, four feet wide, on which I draw lines the whole length, three to each bed, and with the end of the rake handle, make a mark (not a drill) on the surface; on this mark I place the Onions, ten inches apart; I then cover them with leaf mould, rotten dung, or any other light compost, just so that the crowns appear exposed. Nothing more is necessary to be done until they shoot up their tops; then, on a dry day, they are earthed up, like potatoes, and kept free from weeds until they are taken up. In the west of England, where this kind of Onion is much cultivated, I understand that it is the

practice to plant on the shortest day, and take up on the longest. The smallest Onions used for planting swell and become very fine and large, as well as yield offsets; the middle-sized and larger bulbs produce great clusters.*

This has been called the *Egyptian Onion*, under the impression that it was originally introduced from Egypt, when our army was in that country; but as I grew it at Messrs. Drivers' nursery in 1796, two years before the date of the battle of the Nile, this supposition must be erroneous. By some it is called the *Potatoe Onion.* A particular account of its first cultivation in Scotland will be found in the *Transactions of the Caledonian Horticultural Society.*†

I have never observed it to throw up flower-stems, the abundant produce of the root rendering the more usual mode of increase by seed unnecessary.

I remaiu, Sir,

Your very obedient Servant,

John Maher.

Arundel Castle, Oct. 5, 1818.

* Mr. George Dymond, of Exeter, one of the Corresponding Members of the Horticultural Society, has communicated the following circumstances, relating to this Onion. It has been known in Devonshire for about twenty years, and does not seem to be recollected in that county for a longer period. The bulbs are commonly planted in rows, twelve inches apart, and six inches from each other, in the row, being earthed up with the hoe, as they grow; the smaller ones answer better for planting than the largest, yielding a greater increase. It is found that these Onions do not keep well later than the beginning of February.

† Vol. i. page 343.

LIX. *On Training the* Fig-tree. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read March 2, 1819.

If a committee of the most experienced and scientific Members of this Society were to be appointed for the purpose of ascertaining in what manner the *Fig-tree* might be best trained, so that it should neither ripen its wood nor fruit, I suspect it would require all their skill and ingenuity to point out a much more efficient mode of mismanagement, than that usually adopted in the culture of that fruit-tree. The defects of it, for training to a wall, are the exuberance of its growth, and the consequent excessive production of barren wood, and the great width of its leaves, by which both its young wood and fruit become injuriously shaded. A more effective method of calling into operation the first of these defects could not readily have been invented than that of training the branches perpendicularly upwards; because this (in common with almost every species of tree) grows most luxuriantly when trained in that direction; and, comparatively with its growth, affords the smallest quantity of bearing wood: and it would scarcely be possible to discover a method by which the foliage of the Fig-tree could be made to operate more injuriously, than that of suffering, as is usually seen, a great number of contiguous stems to ascend upwards from the root in parallel lines. It, therefore, is not wonderful that the remark of gardeners in some parts of England, which

is recorded by Mr. Wickham, in the Horticultural Transactions,* that a trained Fig-tree never bears fruit, should, to a great extent, prove well founded.

The mode of pruning recommended by Mr. Wickham is, I entertain no doubt, exceedingly good for warm situations; but I think it well calculated for those only: for in cold situations, unless the season were very favourable, the second young wood would rarely acquire sufficient maturity to afford fruit, or even to live. For all such I would therefore recommend the following mode of treatment; which I have seen adopted, with the most ample success, in a situation so high and cold that the Peach and Nectarine can scarcely be made to succeed at all in it, even in the finest seasons; and it is in such situations that the Fig-tree will be found best to deserve culture.

Let the stems, if there be, as usual, many within a narrow space, be gradually reduced to one only; and from the top and parts near it of this, let lateral branches be trained horizontally and pendantly, in close contact with the wall. Under such treatment all troublesome luxuriance of growth will soon disappear; the pendant shoots will not annually extend more than a few inches, and few, or no more leaves will be produced, than those which the buds contain before they unfold. The young wood consequently ceases to elongate very early in the season, and thence acquires perfect maturity; and by being trained close to the wall is placed secure, or nearly so, from injury by the severest frost. The quantity of mature and productive young wood thus necessarily become very great, relatively to the size of the tree;

* Vol. iii. page 83.

and the fruit being in contact with the wall, and not shaded by excess of foliage, acquires an early and perfect maturity. In some experiments which I made last year, and to which I paid very close attention, I found that where I had trained one branch of a Cherry-tree perpendicularly downwards, and another upwards, the fruit ripened most early, and most perfectly upon the pendant branches; and as the branches of the Fig-tree, in, I believe, all its varieties, grow more or less pendant, it appears probable, though I have not attended to this circumstance, that the Figs will ripen best upon pendant branches.

As the young wood, under the preceding mode of management, ceases to grow early in the summer, and the sap consequently ceases to flow so abundantly on the approach of autumn, I think it extremely probable that the main stems of the Fig-tree will be less subject to injury by frost: but if these should require protection, it is obviously more easy to defend one stem, than many.

When small young Fig-trees are to be planted, I have found much advantage in confining their roots in pots of very rich mould; for by these means their luxuriant growth is checked, and early fruitfulness induced: and this habit, when once acquired, will not, I believe, be lost, when the roots are relieved from the constraint of the pots; but I have not yet witnessed the result of this experiment.

LX. *Some Account of the* Collections of Apples, *exhibited at the Meetings of the Horticultural Society, during the Season of* 1818; *with Observations on their Qualities and Names, and a List of the most approved Sorts for the Dessert and Kitchen. By Mr.* John Turner, *Assistant Secretary.*

Read March 2, 1819.

The unusually fine *Collections of Apples,* which were sent to the Society, during the Autumn of 1818, from various parts of the country, as well as from the vicinity of London, induced me to pay particular attention to them, in the view of making, if possible, one step towards a selection and arrangement, which future seasons might enable me, or some one more competent to the task, to complete.

I am well aware that it is only by cultivating, together, all the varieties of reputed merit, that the synonyms will be effectually discovered, and the really valuable Apples be ascertained; yet I trust it will not be useless, in noticing the various collections which have been exhibited before the Society, to point out such errors as have been detected; most of them arising, probably, from ignorance, rather than design.

In observing upon the confusion of names which at present exists, it is by no means intended to impute blame to those who cultivate fruit trees for sale; cultivators are, themselves, no doubt often deceived, and in the multifarious business to which their attention must necessarily be directed, it is no wonder if one sort of Apple is frequently supplied

by them under the name of another. An error of this kind, however, is a serious evil, to say nothing of the disappointment to the purchaser; for unless the mistake be detected in the first instance, the erroneous sort is propagated in its new neighbourhood, under the true name, or the true sort under a false name; and such mistakes occurring in all parts of the country, create a multitude of appellations for the same fruit, increasing, in appearance, the number of varieties to an extent appalling to the view of the most patient investigator.

I had formed an opinion that many fine Apples were to be found in various parts of the country which were wholly unknown in the metropolis; my observations, however, upon the collections of the last season have proved that this is only the case as it respects Apples for culinary purposes; of this kind I have met with many of very great merit, which are unknown to the nurserymen around London, but I have found very few of any value for the dessert, that are not known to them either under their provincial names, or names which they have themselves assigned to them from a wish to claim the credit of their originality.

The scarcity of good Dessert Apples in this country is perhaps to be attributed to the carelessness of growers, who, content with the seedlings which they raise, however worthless, pay little attention towards obtaining more approved varieties. Though this practice prevails to a considerable extent in all parts of England, I am disposed to think it is still more common in Scotland, and that even the best orchards there are very deficient of good sorts. The number of Scotch seedling Apples is immense, with scarcely any of very superior merit amongst them; the Cambusnethan

Pippin is certainly the best, if, indeed, it be a seedling; but I am rather disposed to believe it is of French origin, at least the French have an Apple which it closely resembles.

I trust that the Society will receive the present communication with indulgence, and consider it as an attempt, only, towards ascertaining the best varieties of Apples, and leading to a rejection of the worthless sorts; and I am not without hopes that it may induce some one whose experience is superior to mine to undertake the task.

August 4th. The first ripe Apples of the season were the *White June-eating;* these were exhibited by JOSEPH SABINE, Esq. and Mr. WILLIAM MORGAN, from the Gardens at North Mims. They were the true sort, and very superior to those generally sold in the London market under that name.

Mr. HUGH RONALDS, of Brentford, exhibited sixteen varieties of Summer Apples, most of them correctly named, and all beautiful specimens.

August 18th. Mr. JAMES GRANGE sent from his Garden at Kingsland some Apples under the name of the *Summer Pippin,* an excellent dessert Apple, very rich and sweet; but differing materially from the Summer Pippin of the London markets.

Sept. 1st. Ten varieties grown in the garden of Lord MONTAGU, at Ditton Park, were exhibited. They were extraordinary specimens, in point of size and beauty.

CHARLES WILLIAM HICK, Esq. of Crouch End, exhibited ten sorts, all of excellent growth, and correctly named.

Sept. 15th. DANIEL GILES, Esq. sent from Youngsbury nine sorts; one among them, a small Apple, called by him the *Transparent Apple,* attracted particular notice.

William Forsyth, Esq. sent four varieties of great beauty; one of them, the *Royal Costard*, weighed fourteen ounces and a half.

Five varieties were exhibited by Mr. William Griffin, gardener to Samuel Smith, Esq. of Woodhall, in Hertfordshire. Of these, the *Norfolk Storing*, well known as a good hardy Apple, and the *French Crab*, came with incorrect names.

Mr. Thomas Moffat, by direction of Viscount Sidney, sent some *White Easter Apples* from his Lordship's garden at Frognal near Foots-cray. They were very superior, large Apples, and are well deserving a place in every good collection.

Mr. Thomas Tanner, gardener to Lord Henry Fitzgerald, at Thames Ditton, sent three varieties. The *Golden Knob*, the *Crofton*, and the *Wine Apple*. The Golden Knob proved to be the *Cluster Golden Pippin*, and the Wine Apple is elsewhere called the *Bridgewater Pippin*; this latter is a fine, large Apple, of great worth.

Mr. Isaac Oldaker sent eight sorts from Sir Joseph Banks's garden at Spring Grove. Amongst them the *Spring Grove Crab*, which appears to be the true *Transparent Crab*. This makes an excellent preserve.

Mr. John Wilmot, of Isleworth, sent specimens of nine varieties; all very fine market fruit.

Thomas Reynolds, Esq. brought from his garden at Carshalton specimens of four known varieties.

Mr. Hugh Ronalds exhibited a superb collection of fifty-eight sorts, grown in his own gardens. It was considered the finest exhibition of Apples ever made to the Society.

October 6th. Mr. Joseph Kirke exhibited a large collection,

a part of which were left for examination; there were few misnomers amongst them: the whole were of fine growth.

The Rev. William Metcalf sent some specimens of the *Alexander Apple,* from his garden at Foulmere, near Royston. Mr. Metcalf was not aware that this Apple had been noticed in the Society's *Transactions.* He describes it as a Siberian Apple, most luxuriant in growth, and a free bearer. One of the specimens measured within a quarter of an inch as large as that sent to the Society in a former year by Mr. Lewis Kennedy, which had been imported from Russia.

Mr. Robson, of Crofton Pound, near Orpington, Kent, sent eight sorts of extraordinary size and beauty.

Sir Thomas Wilson, sent twenty-three sorts, grown in his garden at Charlton; but they were principally seedlings, without names.

Orange Apples of the Isle of Wight, sent by Mr. William Wilkins, were tasted. They had become woolly from overripeness. This Apple, which is so excellent when fresh plucked, will not bear keeping.

Specimens of thirteen varieties were sent by Sir Samuel Young, grown in his garden at Formosa Place, near Maidenhead; they were unusually large and fine.

Sir Thomas Frankland, sent ten sorts from his seat at Thirkleby in Yorkshire; the most remarkable of which was the *Rymer Apple,* noticed hereafter.

Daniel Giles, Esq. sent a second exhibition, from his garden in Hertfordshire, all of them well known kinds, and well grown.

Mr. James Backhouse of York sent eight sorts; two,

the *Darlington Pippin* and *Copmanthorpe Crab,* were seedlings of a superior kind, but are not known to the London gardeners. They are described by Mr. BACKHOUSE as great bearers.

October 20th. JOHN ELLIOT, Esq. sent a collection of very fine sorts; among them were several not common in the neighbourhood of London.

Mr. HUGH RONALDS of Brentford, exhibited fifty-three sorts, in addition to his former collection, and in no respect inferior.

ROBERT HOLDEN, Esq. exhibited one hundred and twenty sorts, collected in Derbyshire and Nottinghamshire. This collection was curious on account of the great number of purely provincial Apples which it contained; the most valuable are included in the annexed Lists.

Sir GEORGE STEWART MACKENZIE sent three sorts of Scotch Apples. One of them, the *Brown Apple of Burnt-Island,* deserves general cultivation.

MICHAEL MUCKLOW ZACHARY, Esq. exhibited seven fine specimens of excellent varieties, grown on dwarf trees, in his garden at Strand-on-the-Green.

Mr. MOSES BROWN of Glasgow sent seventy-eight sorts of Scotch Apples, including all the early varieties produced in Clydesdale.

November 3rd. JOHN SUDLOW, Esq. of Thames Ditton, sent to this and several subsequent Meetings, specimens of a middle sized conical Apple, under the name of the *Fall Pippin,* the produce of a tree imported from America. It is a very rich Pine-flavoured Apple, and is said to be the same which

has been noticed by Mr. Cobbett in some of his recent publications.

Joseph Sabine, Esq. brought specimens of the true *Pomme de Niège*, or *Snow Apple* of Canada, grown in his garden at North Mimms.

Nine Varieties of Irish Apples were sent by the Earl of Mount Norris; some of them remarkably fine.

George Wilbraham, Esq. sent twenty-two sorts from Cheshire; there were many good varieties amongst them, particularly one called the *Kitchen Reinette*.

Sixteen varieties were sent by Mr. William Morgan from North Mimms Place. They were very fine specimens, and amongst them the *Herefordshire Queening* merits particular notice, for its size and firmness of flesh. This is an Apple which deserves more general cultivation for the kitchen.

November 17*th*. Twenty vareties were exhibited, sent by M. Stoffels of Mechlin; many of them are little known in England. The *Wyker Pippin* of this collection appears to be the *Wyken Pippin* of the English gardeners.

Sir George Stewart Mackenzie sent nineteen sorts of Scotch Apples, the greater part of which are little known in the South. The most valuable of them are included in the Lists.

Thomas Hare, Esq, exhibited forty-seven sorts of very fine Somersetshire Apples, collected from the vicinity of Taunton.

Wlliam Forsyth, Esq. sent fourteen sorts, all good varieties.

Mr. Moses Brown, of Glasgow, sent one hundred varie-

ties of Clydesdale Apples, consisting, for the most part, of sorts little known in England; amongst them the *Cambusnethan Pippin* holds a distinguished place as a Dessert Apple. These were in addition to the collection sent by him on the 20th of October.

December 15*th*. Mr. Daniel Judd sent thirty-four sorts, grown in the garden of Charles Campbell, Esq. at Edmonton. There were some seedlings of worth amongst them.

Fifty sorts of Scotch Apples were sent by Sir George Stewart Mackenzie, partaking of the same character as the former collection.

Twenty-two sorts were received from M. Noisette of Paris, seventeen of which were Cider Apples. The other five were remarkably fine. Amongst them was the *Reinette Blanche d'Espagne,* which equalled in size the *Baltimore Apple,* figured in the *Transactions,* vol. iii. p. 120.

John Braddick, Esq. sent four varieties, from his garden at Thames Ditton, among which was a Summer Apple, called by him the *Reinette Franche,* but which is not the Apple described by Duhamel under that name.

Mr. Lewis Navarro, a Corresponding Member of the Society, sent three sorts, brought by him from the Canary Islands. One of considerable size, called there the *White Apple,* closely resembles the *Hawthorndean.*

January 5*th,* 1819. Twenty-eight sorts sent by M. Seidel of Dresden, were exhibited; many of them very fine, and but little known in this country.

January 19*th*. John Braddick, Esq. sent forty-two sorts, the produce of his own garden, not less remarkable for the fineness of their growth, than for the excellent state in which they had been kept.

In addition to the preceding collections, there were exhibited at various Meetings, single Apples of very great merit, the most valuable of which I have included in the Lists which follow. The trees of many of them being in private gardens, it will, necessarily, be some time before they become common in the nurseries; but as the Society is ever ready to disperse those grafts with which the liberality of individuals supplies it; it is to be hoped, that ere long, every good provincial Apple, as well as the best of those known on the Continent, will be found in the gardens of the nurserymen.

A List of the best sorts of Apples for the Dessert, *which were exhibited at Meetings of the Society, in the last Season, arranged nearly in the order in which they were received.*

White June-eating.
Red June-eating.
Oslin.
Manks Codlin.
Hawthorndean.
Sack and Sugar Apple.
Red Quarenden.
Nonesuch.
Kerry Pippin.
Peach Apple.
Summer Pippin.
Orange Pippin.
Golden Reinette.
Morden Bloom Apple.
Yellow Ingestrie.
Royal Pearmain.
Wormsley Pippin.
Golden Pippin.
Ribston Pippin.
Pomme de Niège.
Orange Apple (Isle of Wight).
Pine Apple Pippin.
Cluster Golden Pippin.
Crofton Apple.
Grange Apple.
Ashmead's Kernel.
Fearn's Pippin.
Kirke's Golden Reinette.
Margil.
Downton Pippin.
Franklin's Golden Pippin.
Hall Door.
Hughes's Golden Pippin.
Loan's Pearmain.
Winter Pearmain.
Spanish Pearmain.
Newtown Pippin.
Golden Harvey.
Pitmaston Russet Nonpareil.
Braddick's Nonpareil.

Breedon Pippin.
Formosa Pippin.
Formosa Nonpareil.
Blenheim Pippin.
Fall Pippin.
Carnation.
Brown Apple of Burnt-Island.
White Cockle Pippin.
Nutmeg Cockle Pippin.
Kirke's Fame.
Lamb Abbey Pearmain.
Marmelade Pippin.
Brindgwood Pippin.
Wyken Pippin.
Lemon Pippin.
Aromatic Russet.
Christie's Pippin.
Pyle's Russet.
Golden Nonpareil.
Cornish July-flower.
Scarlet Nonpareil.
London Pippin.
Court-pendu.
Padley's Pippin.
Robinsons's Pippin.
Borsdorff Apple.
Queen's Apple.
French Reinette.
Dumelow's Crab.
Belledge Pippin.
Bath Apple.
Travers's Apple.
Eve Apple.
Pomme de Gèle.
Newbold's Duke of York.
American Pippin.
Syke House Russet.
Court of Wick.
Sam Young.
Ross Nonpareil.
Balgone Pippin.
Pomme Roi.
Royal Somerset.
Golden Knob.
Plate Apple.
Cambusnethan Pippin.
Reinette Grise.
Black Nonpareil.
Ord Apple.
Balmanno Pippin.
Strawberry Apple.
Ganges Apple.

OBSERVATIONS.

White June-eating. This is a desirable Apple, from its coming in so early in the season; but care should be taken to procure plants of the true sort; there is a very inferior fruit generally sold for it, in the London market.

Red June-eating. This is also called the *Margaret Apple;* it is a very fine summer fruit.

Oslin. The Scoth gardeners call this also the *Burr-Knot,* and the *Original,* or *Mother Apple.* It has a remarkably aromatic flavour.

Manks Codlin. This Apple is conical, rather irregular in shape, with its eye depressed, and its stalk deeply inserted; it is of a fine lemon colour, with bright red to the sun, and an indistinct, white curdling all over, which goes off if the Apple is long kept. The flesh is white, with an agreeable brisk juice, which renders it also a good kitchen Apple. I have not met with any Apple respecting which more confusion prevails than this. In Mr. Ronalds's collection, exhibited Sept. 15th, it appeared under three different names, viz. *Manks Codlin, Irish Codlin,* and *Carlisle Codlin.* In Sir George Mackenzie's collection, exhibited Nov. 17th, it is called the *Eve Apple,* no doubt on the authority of the *Memoirs of the Caledonian Horticultural Society,* Vol. ii. page 306; an Irish origin is there assigned to it, but it does not appear to be known in Scotland under its true name. Mr. Brown of Glasgow calls it the *Irish Pitcher,* or *Eve Apple.* In the collection of Cheshire Apples received from George Wilbraham, Esq. it is called the *Summer Codlin.*

Hawthorndean. I have before observed that the Apple brought from the Canary Islands by Mr. Navarro, and exhibited, December 15th, closely resembled the Hawthorndean; I am strongly inclined to consider them to be the same, from the circumstance of both Apples being known by the name of *White Apple;* but whether Hawthorndean or the Canary Islands produced the tree, I am unable to ascertain.

Morden Bloom Apple. This was exhibited August 18th,

by Mr. Sutton of Morden, now the occupier of the garden of the late Abraham Goldsmid, Esq. Mr. Sutton knows nothing of its history, nor has he given it a name. Not having met with any Apple like it, I have ventured to call it the *Bloom Apple,* from its singular beauty. It is of great excellence, and the tree is an abundant bearer.

Pomme de Niège. This Apple, according to Forsyth, was introduced into this country from Canada, by Mr. Barclay of Brompton. It is by him called *Fameuse,* a name which has generally been adopted by the nurserymen, but sometimes corrupted into *Formeuse.* It would be well, however, to restore its original appellation, so very characteristic of the colour of its flesh, which is as white as snow.

Orange Apple, of the Isle of Wight. This variety is noticed in the Society's *Transactions,* Vol. ii. page 403.

Cluster Golden Pippin. So called from its clustering mode of growth. It is apt, more than any other Apple, to form monstrosities. A tree in a garden at Thornbury, near Bristol, uniformly produces its whole crop in perfectly formed twins, specimens of which were sent to the Society by Mr. William Bullock. By some it is called the *Stone Pippin,* from its hardness and keeping quality, and by others the *Golden Knob,* but erroneously.

Crofton Apple. It is usual to divide the Crofton into *Red* and *White;* there is, however, no real difference, exposure alone producing the higher colour. This is in some places called *Saul Apple.*

Grange Apple. The Apple here recommended is the Grange of Mr. Knight, and resembles in many respects the Orange Pippin from which it sprung. A great number of Apples pass under this name, assigned to them no doubt,

from places where they were produced, Grange being a term applied in many parts of England to a farm residence.

Newtown Pippin. This is the French *Reinette de Canada;* a very high flavoured, valuable Apple, either for the dessert or the kitchen.

Pitmaston Russet Nonpareil. A seedling raised by JOHN WILLIAMS, Esq. of Pitmaston near Worcester. It is described by Mr. SABINE in the *Transactions* of the Society, Vol. iii. page 267.

Breedon Pippin. A seedling raised by Dr. BREEDON of Bere Court, in Berkshire, a particular account of which will also be found in the *Transactions* of the Society, Vol. iii. page 268.

Braddick's Nonpareil. A seedling raised by JOHN BRADDICK, Esq. of Thames Ditton, also described by Mr. SABINE, Vol. iii. page 268.

Formosa Pippin. This is the produce of a tree in the garden of Sir SAMUEL YOUNG, at Formosa Place, near Maidenhead. It partakes much of the appearance and character of the Ribston Pippin, but has a more melting flesh, and will not keep so long.

Formosa Nonpareil. This was also produced in the Garden at Formosa Place, and is an extraordinary fine Apple, combining the flavour of the Nonpareil and Golden Pippin.

Blenheim Pippin. Also called the *Blenheim Orange,* or *Woodstock Pippin.*

Fall Pippin, or as we should call it in this country, the Autumn Pippin. Mr. COBBETT has brought an Apple with this name into notice by his panegyric upon it in his weekly pamphlet. An imported plant of the present variety has fruited in the garden of JOHN SUDLOW, Esq. of Thames

Ditton. The fruit is oval, about the usual size of a Pearmain. In colour it resembles the Golden Pippin, but is sprinkled with minute brown spots. It has a rich Pine flavour, and firm crisp flesh. Mr. Coxe describes a Fall Pippin in his "*View of the Cultivation of Fruit Trees in America*," page 109, which attains to a much larger size, frequently weighing a pound, and which is used both for the dessert and the kitchen, and is esteemed the best in the New York market.

Brown Apple of Burnt-Island. This is a Scotch Apple of considerable reputation. It ripens rather early, and is very fine when fresh gathered; but it soon becomes woolly, and loses its flavour. For an account of it see *Memoirs of the Caledonian Horticultural Society*, Vol. ii. page 309.

Cornish July-flower. This very excellent Apple is but little known in the vicinity of London. It is of the middle size, very angular, of a dull green colour, partially covered with an equally dull red; with a yellowish flesh, of a pleasant consistence and very high flavour. It is noticed in the Society's *Transactions*, Vol. ii. page 74.

London Pippin, frequently called the *Five-crown Pippin,* from the five distinct ribs which it shews towards the eye. This is a good Apple, either for the dessert or the kitchen.

Queen's Apple. This is distinct from the *Borsdorff*, which is sometimes so called. The Queen's Apple is perhaps the same which is elsewhere called the *Boatswain's Pippin.*

French Reinette. This is an excellent Apple, and, I believe, is the same as the *Fenouillet Rouge* of Duhamel; but the English-grown specimens have less of the Fennel flavour.

Dumelow's Crab. This is a very handsome seedling, raised by Mr. Dumelow of Derby. It somewhat resembles the

Nonesuch, but has a firmer flesh, and higher flavour. It is also a good Apple for the kitchen, and is an excellent keeper.

Belledge Pippin. This is a Derbyshire Apple, a little more oval than Christie's Pippin, but otherwise externally like it. Its flesh is yellow, melting, and well flavoured.

Bath Apple. This is also a Derbyshire Apple of considerable merit; it is of a handsome form, and possesses a high flavoured, saccharine juice.

Travers's Apple. This is the produce of a graft received by JOHN BRADDICK, Esq. from the garden of RICHARD TRAVERS, Esq. of Loader in Dorsetshire. It very much resembles the Ribston Pippin, in appearance, but its flesh is more melting, its flavour is higher, and it is a much better keeper.

Eve Apple. This is a handsome, well flavoured Apple, but is not the same as that cultivated under this name by the Scotch gardeners. They have, as has been stated, mistaken the Manks Codlin for it.

Pomme de Gèle. A small globular Apple; colour a bright red on an orange ground. Its flesh is firm, very juicy, and with a fine astringent sweetness.

Sam Young. This is a small globular Apple, with the eye a good deal depressed; ground colour bright yellow, with minute brown spots, and a considerable quantity of rough leathery russet round the stalk; in some specimens, bright scarlet to the sun. Flesh inclining to yellow, mixed with green, tender, melting, juicy and intensely sweet, with a delicious flavour, little, if at all inferior to the Golden Pippin. It is an Irish Apple of high reputation, though scarcely known in England. The tree is hardy, and an abundant

bearer. Specimens of the Apple were sent to the Society in November last, by the Earl of Mount Norris; some were, also, formerly exhibited to the Society by Mr. Stephen Jeeves, from the garden at the Hoo, in Hertfordshire.

Balgone Pippin. A Scotch Apple, resembling a fine grown Golden Pippin, but inferior to it in flavour, though well deserving cultivation.

Royal Somerset. A more beautiful Apple than this can hardly be seen, and on that account it is desirable for the dessert; but the briskness of its juice, when first gathered, adapts it better for the kitchen. It mellows by keeping, and is fit for eating in April.

Golden Knob. This name is frequently given to the *Cluster Golden Pippin*, an Apple of very different appearance. The Golden Knob (according to Forsyth) is originally from Enmore Castle. It is a small, handsome, yellow fruit, a little russetted, and has a superior flavour.

Cambusnethan Pippin. A Scotch Apple, originally from the gardens at Cambusnethan; it is rather above the middle size, round, flattened at both ends; eye very large in a regular wide cavity; ground colour yellow, with a profusion of red in irregular splotches. The flesh is white and melting, with a very rich saccharine juice.

Reinette Grise. This, which is amongst the very best of the French Apples, whether its flavour, beauty, or keeping qualities be considered, is not yet common in this country; but from the number of trees which have been recently imported, it will no doubt become generally known.

Black Nonpareil. This is a small angular Apple, with the

stalk thickened like that of the Lemon Pippin. It has nothing of the character of the Nonpareil, but is a rich, high flavoured Apple. I have met with it in the Scotch collections only.

Ord Apple. For a particular description and account of this excellent Apple see the Society's *Transactions,* Vol. ii. page 285.

Balmanno Pippin. This is nearly of the shape and size of a Nonpareil. The flesh is white, melting and juicy, with a good flavour. This is also a Scotch Apple.

Strawberry Apple. This is a Somersetshire Apple, and highly deserving cultivation. It partakes of the flavour of the Cornish July-flower. There is a French Apple, known in this country under the same name, of which great numbers are imported.

Ganges Apple. I have not met with this Apple any where but with Mr. KIRKE, and with Mr. BRADDICK, who, I believe, obtained his tree from the nursery of the former. It is a handsome Apple, of the middle size, keeps well, and is of very great merit.

List of Kitchen Apples *which were exhibited at Meetings of the Society in the last Season, arranged nearly in the order in which they were received.*

Spring Grove Codlin.
Keswick Codlin.
Kentish Codlin.
White Easter Apple.
Shepherd's Newington.
Kentish Broadend.
Hedge's Duncan.
Dutch Codlin.
Norfolk Beaufin.
Carlisle Codlin.
Royal Costard.
Cat's Head.
Newbold's Admiral Duncan
Norfolk Storing.
French Crab.
Tottenham Park Codlin.

Old English Codlin.	Darlington Pippin.
Wine Apple.	Hunt House.
Alexander Apple.	Copmanthorpe Crab.
Beauty of Kent.	Chester Pearmain.
Flower of Kent.	Lincolnshire Holland Pippin.
Minshul Crab.	Coat's Apple.
Hallingbury.	Normanton Wonder.
Striped Holland Pippin.	Best Pool.
Wilmot's Crab.	Northern Greening.
Norfolk Paradise.	Pomme de Violette.
Quince Apple.	White Seal.
Royal Russet,	Hollow Crown Pippin.
Seek-no-further.	Glamis Castle.
Yorkshire Greening.	Reinette Blanche d'Espagne.
Rymer Apple.	Spice Apple.
Kitchen Reinette.	Dutch Belle Fleur.

Spring Grove Codlin. For a particular account of this Apple, see the Society's *Transactions,* Vol. i. page 197.

Carlisle Codlin. This, though not large, is a most desirable Kitchen Apple, possessing a very superior flavour, when dressed. It has a peculiar quality in being fit for tarts and for codling in its most early state. Sir JOHN SINCLAIR has given a particular account of it in the *Memoirs of the Caledonian Horticultural Society,* Vol. i. page 374.

Royal Costard. An Apple of the largest size. Its flesh is not very firm, but being juicy and melting, it is an excellent sauce Apple.

French Crab. This is a globular Apple, slightly plaited at the eye, of a dull green colour, and hard compact substance. It is the best keeper we are acquainted with, frequently lasting two years. Though very well known to the

London nurserymen, it passes under several erroneous names in the country, as the *Claremont Pippin, Winter Queening, Iron Stone Apple, Two Years Apple, Tunbridge Pippin,* and a variety of others.

Tottenham Park Codlin. I have given this name to a very large Apple, specimens of which were sent to the Society by Mr. HENRY BURN, gardener to the Earl of AYLESBURY, at Tottenham Park. Though the tree has attained to full maturity, I am disposed to think that the Apple is unknown in other gardens. The fruit is tall, generally square, with a large eye in a deep cavity, and flattened at the base. Its colour is a dull green. The flesh firm, and juicy, and when dressed is very soft and high flavoured. The tree is healthy, and a great bearer.

Wine Apple. A large valuable Apple was received under this name from Mr. THOMAS TANNER, gardener to Lord HENRY FITZGERALD, at Thames Ditton. It closely resembles the Bridgewater Pippin, but is an earlier Apple.

Alexander Apple. Specimens of this beautiful fruit were exhibited by Mr. LEWIS KENNEDY, at a Meeting of the Society two seasons ago, received by him from Riga. At the Meeting on the 18th August, Mr. JOHN WILMOT, of Isleworth, exhibited one, under the name of *Count Woronzoff's Apple,* which appeared to be the same. I have, in a preceding page, noticed the beautiful specimens of the Alexander shewn by the Rev. Mr. METCALFE to the Society.

Hallingbury. This is an Apple very well known in various parts of the country. It has lately received the name of *Kirke's Scarlet Admirable,* by which it is now known in the vicinity of London.

Rymer Apple. So named in compliment to a gentleman at Thirsk, who raised the tree several years ago. We are indebted to Sir Thomas Frankland for bringing this excellent variety into notice. It is a handsome Apple of the middle size, with the eye considerably sunk; the ground colour of the skin is a bright green, deepening to yellow, with a good deal of red striping, freckled with russet; the flesh is soft, melting, and juicy, with a fine brisk flavour, which becomes very rich when the fruit is baked. The original tree has been grubbed up, but many young plants have been raised by grafts from it, several of which have been presented to the Society by Sir Thomas Frankland, and dispersed amongst the nurserymen round London, who are Fellows of the Society.

Coates' Apple. A very large compact Apple from the neighbourhood of Derby, sent by Robert Holden, Esq. It possesses every requisite for a good kitchen Apple, and as the tree is an abundant bearer, it should be generally cultivated.

Dutch Belle Fleur. Specimens of a large Apple, withont a name, were sent to the Society by Mr. Sutton, of Morden, which, by specimens subsequently received from Holland, proves to be the Belle Fleur, a fruit very uncommon in this country, although of the highest quality, being excellent for the Kitchen when first ripe, and coming into eating in the months of April and May.

LXI. *Observations on the* Blacking of Garden Walls, *as it affects the ripening of Fruits. In a Letter to the Right Hon. Sir* Joseph Banks, *G.C.B. P.R.S. &c. By Mr.* Henry Dawes.

Read November 2, 1818.

Sir,

I take the liberty of communicating to you my remarks on a garden wall, on which I have been making experiments at Slough. It faces the south, and against it, about the middle, a young Grape vine is trained. Two years ago, I covered a portion of the wall with thick black paint. The Vine was divided into two equal parts, one half was trained on the painted, and the other on the plain wall. The season was so unfavourable last year, that scarcely any out-door Grapes came to perfection, but those on the blackened part of the wall were much finer than those on the plain part. This year the success of my experiment has been complete. The weight of fine Grapes gathered from the blackened part of the wall was 20lb. 10 oz., while the plain part yielded only 7lb. 1 oz., being little more than one-third of the other. The fruit on the blackened part of the wall was also much finer, the bunches were larger, and ripened better than on the other half; the wood of the Vine was likewise stronger and more covered with leaves on the blackened part.

It is a generally known fact, that a black unpolished surface absorbs more rapidly than other colours the sun's rays, and thereby becomes sooner heated. It is equally well

known that surfaces which absorb heat most quickly, part with it more easily by radiation when the source of heat is withdrawn, and cool quicker. In the summer time, when the days are long, the wall will be more intensely heated under the blackened surface, and the night (or time of cooling) being short, it may not have returned to the temperature of the air, before it is again subjected to an increase of heat. If the time of cooling were long enough, that part of the wall under the blackened surface, might become actually colder than the part not blackened, and thus the extremes of heat and cold be greater than when the wall was left with its usual surface. In the summer time, however, the wall is not only more intensely heated, but probably retains a great portion of the heat during the night. Horticulturists will decide which of those two causes is efficient in producing the effect I have stated, or whether both may not co-operate; it is not for me to presume to do so, though I should be inclined to think, that in this climate, the intensity had more influence than the uniformity.

I have the honour to be,

your very obedient servant,

HENRY DAWES.

Slough, near Windsor,
October 16, 1818.

LXII. *Account of a Species of* Casuarina, *growing in the Gardens of Belvedere, near Weimar. Communicated by His Royal Highness* Charles Augustus, *Grand Duke of Saxe Weimar, F. H. S., &c. &c. &c.*

Read November 3, 1818.

The species of Casuar tree here represented (sent to Weimar originally under the name of *Casuarina Equisetifolia Linn.*) was, in the year 1810, but a very small shrub, not more than three feet high, and the trunk three-fourths of an inch in diameter. In that year, it was planted in the open air, in good soil, containing a portion of calcareous matter, the substratum of the country being of that nature. It was so placed, as to receive the full influence of the sun in summer, and to be protected from the northern and eastern winds. In the winter it is covered with a temporary building, which is warmed by fire, so as to exclude the frost.

The present height of the tree is sixteen feet and a half, the circumference of the head is forty-two feet, and that of the trunk nearly twenty inches. Near to the tree above described, is another, which was planted five years ago. It was sent from Paris to Weimar, in a flower-pot, and was then a very small shrub. It has already reached the height of eight feet, and the trunk is nearly two inches in diameter.

The largest tree has this year flowered, but without producing any seed, being evidently a diœcious plant. The

Casuarina growing at Weimar.

smaller plant promises to grow taller than the other, but is not likely to form a spreading head. As this tree can bear our climate in a building which only protects it from a degree of cold below the freezing point, it is probable it will grow well in the open air in climates a little more temperate.

With regard to the botanical character of this Casuarina some doubt has arisen. It does not seem to be the species, usually called Equisetifolia. The Belvedere plant, according to its present appearance, is clearly diœcious; it was covered with male flowers, and not a single female was to be seen. Whether there is any truth in the observation, that in monœcious plants one set of flowers sometimes so strongly predominates, as to render the other imperceptible, and that a sort of equality between the two sets of flowers only takes place, as the plant advances in age, need not here be determined. In the case before us, there seems to be no ground for such a supposition. Perhaps all uncertainty concerning the Casuarina in question will be removed by an accurate botanical investigation.

LXIII. *Some Account of the* Vines *at* Valentines House, *near Ilford, in Essex, the Seat of* Charles Welstead, *Esq. F. H. S. with some practical suggestions for the treatment of Vines. By Mr.* George Lowe, *Gardener to Mr.* Welstead.

Read February 2, 1819.

There are three Vines, now under glass, in the gardens at Valentines, all of the same sort, which, though generally styled the Black Hamburg, is in fact a distinct variety, being *Warner's Hamburg*, or the *Red Hamburg;* 1st, the Old Vine, as I shall here call it, for the sake of distinction, which is now about sixty years old; 2nd, an offspring of it, about thirty-five years old, and a third about eight years old, also from a cutting of the original tree; on this last the Grapes were produced, which were exhibited to the Society at the Meeting, on the 1st of September last.

The Old Vine has acquired great celebrity as well from its being the parent of the Hampton Court Vine, as from its extraordinary size and fertility.

The most perfect account of its origin and early history, which I have been able to meet with, is in *Gilpin's Forest Scenery*,* which I have ventured to transcribe, that every thing relating to so extraordinary a tree may be put upon record, in the Transactions of the Society.

Among other remarkable Fruit-trees (says Mr. Gilpin)

* Vol. i. page 153. 2d. Edit.

may be reckoned a Vine belonging to the late Sir Charles Raymond, at Valentines House, near Ilford in Essex. It was planted a cutting in the year 1758, of the Black Hamburg sort; and as the fruit of this species will not easily ripen in the open air, it was planted in a hot-house, though without any preparation of soil, which is in those grounds a stiff loam, or rather clay. The hot-house is a very large one, about seventy feet in front, and the Vine, which I understand is pruned in a peculiar manner, extends two hundred feet, part of it running along the south wall, on the outside of the hot-house. In the common mode of pruning, the species of Vine is no great bearer, but managed as it is here, it produces wonderfully. Sir Charles Raymond, on the death of his Lady in 1778, left Valentines House; at which time, the gardener had the profits of the Vine. It annually produces about four hundred weight of grapes, which used formerly, (when the house I suppose was kept warmer) to ripen in March, though latterly they have not ripened till June, when they sell at four shillings a pound; which produces about £80. This account I had from Mr. Eden himself, the Gardener who planted the Vine. With regard to the profits of it I think it probable, from the accounts I have had from other hands, that when the Grapes ripened earlier, they produced more than £80. A gentleman of character informed me, that he had it from Sir Charles Raymond himself, that after supplying his own table, he has made £120. a year of the Grapes; and the same gentleman, who was curious, enquired of the fruit-dealers, who told him, that in some years they supposed the profits to have

not amounted to less than three hundred pounds. This does not contradict Mr. Edens' account, who said that the utmost he ever made of it (that is, I suppose, when the Grapes sold at four shillings a pound in June) was £84. At the lowest calculation, the profits were prodigious. The stem of this Vine, was, in the year 1789, thirteen inches in circumference."

On the above account I may remark, that no part of the Vine is now trained on the outside of the house. The tree is planted in the centre, and spreads to the right and left. However excellent the management of the tree might have been in Mr. Gilpin's time, it had been extremely ill treated for some years before it came under my care; large branches had been cut off at improper seasons, and no attempt made to prevent the wounds from bleeding: in consequence of which, the tree has been generally injured, and there is one branch, twelve inches in circumference, nearly dead. The Vine at present extends under 1330 square feet of glass. Last year it ripened 2000 bunches of grapes, the forcing of the Vine having commenced on the seventh of January.

The second Vine, which was planted about thirty-five years ago, a cutting from the first, extended in the year 1816 under a surface of 960 square feet of glass. At that time the plant was ill furnished with wood, but by careful pruning I brought it into an improved state, and in the last year it yielded above 1200 bunches, of superior quality.

The third Vine is a healthy young tree, under the same glass as the preceding, but separated from it by a glass partition.

I have heard the extraordinary fertility of the Hampton Court Vine attributed to its roots having forced their way into the great drain or sewer which carries off the water from the Palace, into the Thames, and I am disposed to believe that a similar cause has contributed to the luxuriant growth of the Vines at Valentines. About twenty feet from the ends of the houses, is an artificial piece of water of considerable depth, into which, I have little doubt, the roots have extended themselves; indeed I have spoken with persons here, who assert, that they have seen them in the bottom of the pond, in the summer season, when the water was low and undisturbed.

I will close this communication with a brief account of the method I have adopted of stopping the bleeding of Vines, after the amputation of a branch. In December, 1817, I took off a limb eight inches in circumference, from the old Vine; as soon as the cut was made, I seared the wound with a hot iron, and covered it with sealing wax; upon this I laid a thick coat of pitch, and secured it with a piece of bladder well fastened on with a wax end, and over the whole I laid a considerable body of plaster of Paris. This completely answered the purpose, not the least moisture having ever exuded from the wound, and I have no doubt, that it would be equally effectual if a Vine were cut at any season. So perfect was the cure of the wound in this instance, that a shoot which put forth three inches beneath it, reached the length of eighteen feet the first season. For the external coating of the wounds of Vines planted in the open air, Roman cement would probably answer better than the plaster of Paris.

LXIV. *Directions for raising* Ferns *from seed, as practised by Mr.* Henry Shepherd *of Liverpool. By Sir* James Edward Smith, *President of the Linnean Society, &c. Honorary Member of the Horticultural Society.*

Read March 2, 1819.

In my frequent visits to the Botanical Garden at Liverpool in August and September last, I was struck with the great variety and abundance of the *Fern* tribe, cultivated in the stoves. My attention was also excited by a number of pots covered with bell-glasses placed under the shade of the Palms in the central hot-house, and all apparently filled with moss, which I found to be seedlings of Ferns.

I soon learned, that Mr. Henry Shepherd, a nephew of the well known and very able Curator of that garden, had paid much attention to the raising of these plants from seed, and I requested him to give me an account of his method, which I beg to lay before the Horticultural Society, in Mr. Henry Shepherd's own words.

"*Directions for raising Ferns from seed.*"

"Having provided a common garden-pot, four and half inches in depth and three and half wide, let the bottom part, to the height of one inch, be filled with fragments of broken pots, by way of drain. Over these should be spread a stratum of such soil, as is commonly used, for potting green-house plants, of the depth of two inches; the remaining inch

and half should be filled with brown loamy earth sifted through a hair-sieve, the surface being made perfectly smooth, and on this, the seeds are to be scattered, as evenly as possible. Care must be taken that the wind be not suffered to blow the seeds away, leaving nothing but empty capsules. The seeds being sown, no other covering is requisite than a bell-glass, which should just fit within the rim of the pot, so as to exclude all air. The pot is then to be kept in a pan always half full of water, and set in a shady part of the stove or hot-house, being always regularly watered, as above directed. When the young plants have acquired their second leaf, it is proper to give them a little air by placing a small piece of wood under the edge of the glass, at one side. In a short time afterwards the glass may be entirely removed."

The vegetation of Ferns appears to be less tardy than Botanists have supposed. Specimens of *Hemionitis dealbata** having been brought from Jamaica to Liverpool, on the tenth of July 1817, a few seeds were brushed off them and sown immediately. Several plants thus obtained, perfected seeds by the fifth of August 1818, which being committed to the earth, had produced young plants covering the surface like a fine moss, by the eighth of September following. Specimens of *Pteris Cretica,* and another marked *Pteris acrostichoides,* from William Jackson Hooker, Esq. afforded seeds which have vegetated and produced very fine plants of both species. Dr. William Carey sent from Serampore specimens of *Polypodium giganteum,* and what appears to be

* Willdenow Species Plantarum, Vol. v. page 131.

a new *Diplazium.* These reached Liverpool July the tenth, 1818, their seeds being immediately sown, had produced young plants by the eighth of September. A small Fern from Sicily, with several others of this tribe, collected in the Brazils, by William Swainson, junior, Esq. afforded ripe seeds, which being sown in the spring of 1818, had partly vegetated, and in September had produced *Polypodium decumanum** as well as *Acrostichum calomelanos.* Mr. Shepherd obtained two plants of the latter from seeds brushed from the specimens in the Herbarium of Dr. John Reinhold Forster, now belonging to the Botanic garden at Liverpool, and perhaps fifty years old. He made the experiment on other Ferns in that collection, but without success, which indeed is not wonderful.

The seeds of this order of plants are of course liable to damage from damp, or other accidents, like those of plants in general. It seems moreover that they are very soon shed by the bursting of their capsules, so that they are more likely to be found in such specimens as are just beginning to turn brown in their fructification, than from others more advanced.

Mr. Shepherd remarks, that having sown seeds from a very small undulated variety of *Scolopendrium vulgare,* he found the fronds of the young plants as much undulated as those of the parent.

The following is a list of Ferns which this ingenious and assiduous young man has given to me as raised by himself from seed in the Liverpool garden. His botanical accuracy

* Willdenow Species Plantarum, Vol. v. page 170.

is such, that I have little doubt of the correctness of the names, though I have not had an opportunity of examining many of the specimens, and some of the names are new to me.

Acrostichum calomelanos
Adiantum villosum
Aspidium adscendens
——— *elatum*
——— *fraxinifolium*
——— *trifoliatum*
——— *exaltatum*
——— *Noveboracense*
——— *aculeatum*
——— *lobatum*
——— *dilatatum*
——— *atomarium*
——— nova Species?
——————from Sicily
Asplenium melanocaulon
——— *præmorsum*
——— alia species
Blechnum Australe
——— *Boreale*
Cheilanthes lentigera
——— *odora*
——— alia species
Davallia Canariensis
Diplazium grandifolium
——— a species from the East Indies
——— another species from Barbadoes
Doodia aspera
Gymnogramma Peruviana
Hemionitis rufa
——— *dealbata*
——— alia species
Osmunda regalis
——— a species from Philadelphia
Polypodium phyllitidis
——— *crassifolium*
——— *aureum*
——— *decumanum*
——— *pectinatum*
——— *effusum*
——— *giganteum*
Pteris palmata
——— *pedata*
——— *argentea*
——— *grandifolia*
——— *serrulata*
——— *Cretica*
——— *atropurpurea*
——— *hastata*
——— *caudata*
——— *lanuginosa*
———*Plumierii*
Scolopendrium vulgare
—————— *var. undulatum*
Woodwardia from Mr. Fraser.

LXV. *On the* Love Apple *or* Tomato, *and an Account of its Cultivation; with a Description of several Varieties, and some Observations on the different Species of the Genus* Lycopersicum. *By* JOSEPH SABINE, *Esq. F. R. S. &c. Secretary.*

Read January 5, 1819.

THE great use which has been made of the *Tomato* of late years for culinary purposes, has occasioned it not only to be regulary grown in private gardens, but has also rendered it an object of cultivation for the market of the metropolis. Possessing in itself an agreeable acid, a quality very unusual in the ripe fruit of vegetables, it is quite distinct from any other product of the kitchen garden. It is used, when fresh, in a variety of ways in soups and sauces; and its juice is preserved for winter use, in the manner of ketchup.

The plant, the *Solanum Lycopersicum* of LINNÆUS, is a native of South America, from whence it was early introduced into the southern parts of Europe, and used as an esculent vegetable. DODOENS, in his *Pemptades*,* published at Antwerp in 1583, describes it as grown at that time in the continental gardens, and says that its fruit was eaten dressed with pepper, salt, and oil. GERARDE, in his *Herball*, published in 1597, and PARKINSON, in his *Paradisus*, published in 1656, describe it as a plant kept in England for ornament and curiosity only, though they were aware that the fruit

* Dodonæi Stirp. Hist. 1st. edit. Pempt. 3, lib. iv, cap. 30, page 455

was used in the manner stated above, in the warmer countries of Europe.

To the old gardeners and botanists the plants were known by the more regular name of *Solanum pomiferum,* and they were also called *Poma amoris, Poma aurea, Mala aurea, Love Apples, Amorous Apples,* and *Golden Apples;* the last appellation, as well as the corresponding Latin ones, seems derived from the colour of the fruit. I do not find any specific cause assigned for the other denominations; PARKINSON, who enumerates them, says that they are so called "all as much to one purpose as another, more than for their beautiful aspect." In HERNANDEZ' *History of Mexico,* a reason is assigned for the use of these terms; but it seems rather speculative than appropriate.

The name of Lycopersicum* originated with GALEN, but it has not been ascertained to what plant it was given. GESNER† entered into some investigation on the subject, but it did not lead to certainty. It is clear that the plant could not have been a native of South America, and consequently not the Tomato. But notwithstanding this consideration, ANGUILLARA‡ in 1561, published a conjecture that the Lycopersicum of GALEN was the Tomato, and on this authority it acquired in aftertimes the name of *Lycopersicum Galeni.* In the *Adversaria* § of PENA and LOBEL, in 1570, and in the

* Lycopersicum means *Wolf's Peach* (from λυκος, a wolf, and περσικον, a Peach,) implying that the fruit was of such inferior quality, as to be fit only for the use of that animal.

† See John Bauhin's Hist. Vol. iii. page 620.

‡ Anguil. Simp. page 217.

§ Lobel Adversaria, page 108.

*Icones** of Lobel, in 1581, in conformity with Anguillara's conjecture, it is called the Lycopersicum. In the first edition, of Gerarde's *Herball,*† the term *Lycopertium* is used, erroneously, as I apprehend; for the editor of the second edition‡ substitutes the correct spelling without any comment. Tournefort, in his *Elémens de Botanique,* in 1694, adopted Lycopersicum as the name of a genus, in which he placed the particular plant now treated of.

Miller, in the sixth edition of his *Gardener's Dictionary,* published in 1752, after describing this and some other similar plants of the same genus, says, " the Italians and Spaniards eat these apples as we do Cucumbers, with pepper, oil, and salt, and some eat them in sauces, &c. and in soups they are now much used in England, especially this sort, which is preferred to all the other. This fruit gives an agreeable acid to the soups, though there are some persons who think them not wholesome, from their great moisture and coldness." This account is retained in the last (the eighth) edition of the Dictionary, which Miller published in 1768, where he calls the plant *Lycopersicum esculentum.*

By the Spaniards and Portuguese the plants are called *Tomates* (not Tomatas, as stated by Miller), and thence has come our name *Tomatos.* The Italians formerly called them *Pomi d' oro,* and *Pomi del Peru,* their modern name in Italy is *Pomo d' amore.* Tomate seems to be the original Peruvian appellation; the old European botanists wrote it Tumatle. Tomatle (plural Tomatles) is the name given in Mexico to this and to several plants of the genus Solanum.

* Lobel's Icones, page 270.

† Ger. Herb. 1st. edit. page 275.

‡ Johnson's Ger. Herb. page 346.

The editors of the *Bon Jardinier** describe the Tomato as coming originally from Mexico, but I am not aware of any authority for this statement; for though HERNANDEZ† describes it, he does not particularly distinguish it as a native of Mexico.

I am indebted to our worthy member Mr. JOHN WILMOT, of Isleworth, for the following account (dated 31st December, 1818) of his cultivation and crops of the plant in question: "My method of cultivating the Tomato is as follows. In the beginning of March, I sow a quantity of the seed in the Pine stove,‡ the plants in a few days are fit to be put out into shallow pans of about a foot in diameter, which are filled with fine sifted mould; about fifty plants are put into each pan, they are well supplied with water, are kept a few days in the Pine-house, and then removed into a cooler situation, until the beginning of April; I then pot these plants singly into sixty-sized pots, in which they continue until the season admits of their being put out; which is not until the beginning of May, at which period little injury from frost, which is fatal to the plants, will occur; they are planted into rich earth, at the foot of the banks where Endive and Lettuce grew the preceding winter, about four feet asunder; they require very little, if any, water, when planted out, the ground at that period being sufficiently moist to enable them to root well; as soon as they begin to shoot, I prepare pegs

* Bon Jardinier pour l'année 1818, page 240.

† Hernandez' Hist. Mex. lib. 8. cap. 1, page 295.

‡ When the advantages of sowing seed in a glass-house cannot be obtained, a hot-bed must be substituted, on which the seed may be sowed, and the plants pricked out in the manner of tender annuals, until they are ready to be put into the single pots.

by which I fasten them to the banks, into which they frequently strike root, and so support themselves. I top them as soon as their branches meet, and through the whole summer take particular care to clear off all the lateral shoots, and to thin the leaves, by which the fruit is exposed, and consequently well ripened. In private gardens it is the practice to put out the plants against a wall, training them to it, but I consider a bank to be much the most congenial station for the Tomato."

"My crop in the last season amounted to six hundred plants, and I suppose I gathered from them four hundred half sieves of fruit for the market, each half sieve weighing about twenty pounds.* From the extraordinary fine season, the growth of this fruit round London exceeded the demand, and I had therefore a great quantity undisposed of; taking this and the unripe fruit into account, I am satisfied that on an average each plant produced twenty pounds weight. The crop on several single plants probably weighed forty pounds. Individual fruits were this year of extraordinary size, many of them exceeding twelve inches in circumference, and weighing twelve ounces each."

The ancient and modern writers on plants and gardening all mention varieties of the Tomato, more or less in number, differing both in the colour and shape of the fruit. Several of these were grown last summer in the garden of the Horticultural Society, from seeds imported from France. The plants were raised in the same manner as the common sort, and were trained to a wall with a western aspect, against which they grew to the heighth of nine feet, and were

* A half sieve is the third part of a bushel.

abundantly productive. Though none of them equal in utility the common large red sort, which is usually grown; yet as many persons may be induced to cultivate them on account of their singularity, it will not be altogether useless to notice them. The small-fruited varieties are preferable to the larger ones for pickles.

The varieties of Tomatos with red fruit, which are at present known in the gardens of Europe, are four, viz. the *Large Love Apple,* or *Tomate Grosse* of the French; *the Small Love Apple,* or *Tomate Petite;* the *Pear-shaped Love Apple,* or *Tomate en Poire;* and the *Cherry Love Apple,* or *Tomate Cerise.* The first of these is too well known to require any description. The second sort, the small Red Love Apple, has a globular fruit, rather flattened at the stalk and apex, about four inches in circumference; it sometimes varies from its even shape, shewing a tendency to form the distorted irregular lobes, separated from each other by sutures, of the common large kind. The Pear-shaped Love Apple bears egg-shaped fruit, with its narrow end next the stalk, about two inches long, and between three and four inches in circumference in its widest part; all its fruits are not exactly of the same shape: this kind seems more tender than the others, as its produce does not ripen so early; it is figured by DUNAL,* in his account of the genus Solanum. The Cherry Red Love Apple has fruit the size of a large Cherry, and quite round.

In all these varieties the number of fruits produced on every separate branch or raceme, is greater as the size of each individual fruit is less; in the last sort there are usually

* See Dunal, Hist. des Solanum, &c. Plate 26.

from eight to twelve on each raceme. In flavour the small and the Pear-shaped sorts do not differ from the larger sort; but the Cherry variety is more acid when dressed, and it would certainly be a preferable kind, did not its diminished bulk make it impossible to grow large crops of it in a small space.

There are two varieties with yellow fruit. The first is the *Large Yellow Love Apple.* I saw specimens of the fruit in the last season, but did not observe the plant growing; it is not now much cultivated, and its seed was not amongst the collection received from France in the last spring. It is mentioned both by GERARDE and PARKINSON, and BESLER, in the *Hortus Eystettensis,** gives a figure of it, corresponding in all points, except that of colour, with the figure of the large Red Love Apple, in the same work. The *Small,* or *Cherry Yellow Love Apple,* was raised from the seeds which came from France, where it is called *Tomate Petite Jaune;* its fruit measures from three to four inches in circumference, is of a pale yellow colour, from ten to twelve growing on each raceme; it is globular, but a little flattened at top and bottom; some shew a disposition to swell out into distinct lobes, and become of a larger size; from the seeds of such fruit, if necessary, the large sort might be raised. When dressed as a sauce, the flavour of the yellow kinds is so inferior to that of any of the red ones, that they can never be considered deserving of cultivation for use. The small Yellow Love Apple is figured and described as a distinct species by JACQUIN,† under the name of *Solanum Pseudo-lycoper-*

* Plantæ autumnales, Ordo 1. folio 1. fig. 1.

† See Hortus Vindobonensis, Vol. i. page 4, tab. 11.

sicum. By DUNAL,* who has made a species of the Red Cherry Tomato, it is considered as a variety of that kind, which it resembles in shape and size, differing only in colour.

Some Horticultural works mention a *White Love Apple,* but I have not been able to obtain any very satisfactory account of it, still less to find it in cultivation. I suspect that it has been lost many years since from our gardens. It is, however, mentioned by BESLER, (whose work, published in 1613, I have already noticed) and by TOURNEFORT, who refers to the plant in CASPAR BAUHIN'S *Pinax.* These authorities may perhaps be considered as sufficient evidence of its former existence,

There is reason to suppose that, besides the White Love Apple, other varieties have disappeared. CASPAR BAUHIN in his *Pinax*† says that the Solanum pomiferum, had "fructus lutei, auricolores, aliquando pulchre rubentes : rarius albi :" the *Golden coloured* ones, which are also mentioned by other old writers, and even by DODOENS, are not now to be found. TOURNEFORT‡ mentions nine kinds, the first seven of which, I conceive, are all varieties of one species. They are as follows : 1. *Lycopersicum Galeni.* 2. *L. fructu rubro non striato.* 3. *L. fructu luteo.* 4. *L. fructu albo.* 5. *L. fructu rubro pallescente.* 6. *L. fructu cerasi rubro.* 7. *L. fructu cerasi luteo.* 8. *L. fructu striato duro.* 9. *L. americanum arborescens.* The first is our large Red Love Apple. The second is perhaps the small Love Apple, which has red

* See Dunal Solan. page 113, and Solan. Synop. page 4.

† See C. Bauhin Pinax, page 167.

‡ See Inst. Rei Herb. edit. 3, vol. i. page 150.

fruit without sutures; the third is the large Yellow Love Apple; the fourth is the large White Love Apple mentioned above; the fifth does not now exist, but was growing in the Royal Garden at Paris in TOURNEFORT's time; the sixth is the Red Cherry Love Apple; the seventh is the Yellow Cherry Love Apple; the eighth and ninth are clearly distinct species, not having any resemblance to the Tomato, either in appearance or use.

In addition to the Love Apples which have been here described as cultivated in the European gardens, we have information, through LOUREIRO and RUMPHIUS, of some others, which appear to be natives of the East Indies. LOUREIRO* describes a plant, which he calls Solanum Lycopersicum, as growing (*incultum*) in the fields and gardens of Cochin-China; it has small leaves, and white fruit of moderate size, nearly round, and three-lobed; he does not state that the produce of the plant is edible, it may however be so; but from the account he gives of it, I suspect it to be a species distinct from the common Tomato. In RUMPHIUS's *Herbarium Amboinense*† are described two kinds of Poma Amoris, which are used in cookery in Amboyna, and called by the Malays *Tamatte;* these are certainly very different from those we possess in our gardens, and may be specifically distinct. The first, the *Tamatte Tayris*, or *Furrowed Tomato,* has leaves like our plant, with fruit, in shape resembling an Orange when peeled, shewing even divisions of its lobes; it is, however, very small in size; at first its colour is golden, but it becomes a splendid red when ripe; this is figured by

* See Flora Cochinensis, page 130 and 131.

† Vol. v. page 416.

Rumphius in the place above referred to. The second sort, the ***Tamatte Bontal***, or ***Red Tomato***, has small and smooth leaves, with a roundish fruit, rather flattened, and without furrows; its colour, when ripe, is a brilliant red. These three plants, would be an acquisition to the European gardens.

I have already observed, that Tournefort had placed the Love Apple in his Genus Lycopersicum; Linnæus reduced the three Genera of Solanum, Melongena, and Lycopersicum of Tournefort, into his Genus Solanum; but Lycopersicum has been subsequently separated, and particularly by M. Dunal, of Montpelier, in his elaborate *Histoire des Solanum et des Genres qui ont été confondus avec eux*, published in 1813. He has called the Solanum Lycopersicum of Linnæus, *Lycopersicum esculentum*, by which name it has since been, and will probably continue to be, known to botanists.

It seems likely that all the plants which are considered as species of the Genus Lycopersicum of Dunal produce edible fruits, and some of them not at present in cultivation, may prove valuable esculents, though the size and great produce of the L. esculentum will always insure it a preference, where magnitude of crop is looked to. This conjecture is confirmed as to one of the plants by M. Humboldt. In the personal narrative of the Travels of Messrs. Humboldt and Bonpland,* it is stated that the *Lycopersicum Humboldtii* is cultivated in gardens, that the fruit is round and small, and has a fine flavour. It appears from the description of this species, given in the account† of the new plants discovered

* See English Translation, Vol. iv. page 163.

† Voyage de Humb. et Bonp. Nov. Gen. et Spec. Vol. iii. page 18.

by the above travellers, that this is also called *Tomates* by the inhabitants of the country where it grows.

M. Dunal, in a more recent work than that above mentioned, entitled *Solanorum, &c. Synopsis,* published in 1816, enumerates ten species of Lycopersicum.* In this, and in his *Histoire des Solanum,* are L. pyriforme and L. cerasiforme, being the Pear-shaped and Cherry Love Apples which have been described. I strongly suspect that not only these, but several others, if not all, of the supposed species which do not appear to have been found wild, will prove to have one

* The following are the species of Lycopersicum enumerated by Dunal in his *Synopsis;* it will be observed that ascertained habitats are assigned to five only of the ten species.

1. L. pimpinellifolium. Lin. *Sp. Pl. Edit.* 2. vol. i. p. 265. Habitat in Peruvia et Brazilia.
2. L. regulare. Habitat ———, in horto Gaditano lectum.
3. L. Peruvianum. Lin. *Sp. Pl. Edit.* 2. vol. i. p. 265. Jacq. *Ic. Rar.* vol. ii. tab. 327. Habitat in Peruviæ aridis locis.
4. L. dentatum. Habitat ———.
5. L. hirsutum. Humb. et Bonpl. (*Nov. Gen. et Spec.* vol. iii. page 18.) Habitat in agris Peruvianis, prope Loxa.
6. L. Humboldtii. Willd. *Hort. Ber.* vol. i. page 27. tab. 27. Ejusdem *Enum. Hort. Ber.* page 235. Habitat in America meridionali ad fluvium Rio Negro.
7. L. pyriforme. Solanum pomiferum. Cav. *Descript.* page 112. Habitat———, in hortis botanicis cultum.
8. L. Cerasiforme. Solanum Lycopersicum β. Lin. *Sp. Pl. Edit.* 1. vol. i. page 185. Solanum pseudo-Lycopersicum, Jacq. *Hort. Vind.* vol. i. tab. 11. Habitat in locis maritimis Peruviæ; in hortis cultum.
9. L. esculentum. Solanum Lycopersicum. Lin. *Sp. Pl. Edit.* 1. vol. i. page 1815. Habitat in America calidiore?
10. L. procumbens. Miller's *Dict.* Habitat. ———

common origin. I have been induced to form this opinion not only from the circumstance that no wild habitat is assigned to them, but from observing that in the *Flora Peruviana** of RUIZ and PAVON, the Solanum Lycopersicum of LINNÆUS (Lycopersicum esculentum) is mentioned as only cultivated in the gardens of Peru, whilst the small round red-fruited plant (the Cherry Love Apple of ancient and modern authors) is said to grow abundantly in wild rough places, near the sea coast (*in ruderatis maritimis*) in Peru. This last plant, called by the natives *Tomate redondo,* I think will ultimately be found to be the type from whence all the other garden kinds, however different in shape or colour, have originally sprung. The large distorted fruit of the common Love Apple, which M. DUNAL† describes as being produced by the coalition of several flowers together, evinces an accidental origin which cultivation has preserved; and the strong disposition which the fruit of all the others, except the Red Cherry Love Apple, shews to sport and run from their true figure, furnishes an additional argument against their being considered as separate species.

I suppose that the Cherry Love Apple was introduced from its native country into Europe nearly about the same time as the larger kind. CASPAR BAUHIN, in his *Pinax,*‡ published in 1623, has among his Solana baccifera the *Solanum racemosum cerasorum forma.* Subsequently it seems to have attracted the notice of botanists§ and gardeners more than the other varieties, except perhaps the large Red and large Yellow Love Apples; besides these two, it is the only one

* Vol. ii. page 37.

† Dunal, Solan. page 115.

‡ See C. Bauhin. Pin. page 166 and 167.

§ See J. Bauhin. Hist. Vol. iii. p. 623.

that Parkinson* notices, he calls it the ***Pomum Amoris minus,*** and also ***Malum Æthiopicum ;*** but he was mistaken in this latter name, not only as to the plant, but as to its origin ; the Malum Æthiopicum of all other authors is a very distinct species of Solanum. Linnæus† made the Cherry Love Apple a variety of his Solanum Lycopersicum, and took no notice of any other. Miller, in his Dictionary,‡ says, that he cultivated this, as well as the Yellow Cherry Love Apple ; they were used in medicine in his time.

* Paradisus, page 379.

† Sp. Plant. edit. 1, Vol. i. page 185.

‡ See 6th and 8th editions.

Frames for training Vines in a House.

LXVI. *Description of a moveable* Frame *for* training Vines *in a House, to protect them from Frost, and to facilitate the Operation of Pruning. In a Letter to the* Secretary. *By* John Elliot, *Esq. F. R. S. &c. Vice President.*

Read March 2, 1819.

Dear Sir.

In Vineries, particularly those which are forced early, great attention is required to guard against the effect of severe frosts; the gardener, therefore, ties his Vines at a considerable distance from the glass: but as the spring advances, it is very desirable that he should give them the full benefit of the sun. These two objects are easily attained by means of a moveable Frame, with wires at equal distances, upon which the Vines are trained. I am not aware that this plan has heretofore been adopted; but I find it exceedingly convenient, and therefore recommend it to the attention of the Horticultural Society: for, independant of the simplicity of its construction and operation, much time is saved in pruning, &c., as the season advances; for by lowering the Frame, and laying a board across the pit, the gardener can reach every part of the Vine without a ladder.

Herewith you will receive a drawing of the Frame, as fixed in my Vinery; it is divided into two, for the greater convenience of moving it.

The wires should be fastened only at one end, to allow of

contraction and expansion; at the other end, they may be kept in their place by small staples.

I am, dear Sir,

Yours, very faithfully,

JOHN ELLIOT.

Pimlico Lodge,
February 19*th,* 1819.

References to the Plate.

A. The frame suspended by hinges to the front plate of the house.

B. Rafters shewn as cut off below the lines of the frames, to admit the frames being seen.

C. Single pulley, screwed to the under side of the second rafter (from the ends of the house,) and centre rafter.

D. Lines fixed to the top rail of the frame.

E. Double pulley through which the lines pass from B, to draw up or let down the frame.

F. Hook to fasten the lines.

G. Blocks to stop the frame from falling too low.

LXVII. *Notices of* Subjects communicated *to the Horticultural Society, between April* 1*st*, 1818, *and November* 1*st, of the same Year, of which Separate Accounts have not been published in its Transactions. Extracted from the Minute Books and Papers of the Society.*

May 5th, 1818. Read a Letter from Mr. Stair of Aldermaston, in Berkshire, correcting an error relative to the age of the original tree of *Williams' Bon Chretien Pear*, described in the Second Volume of the *Transactions*, page 250, in which it is said that the plant was raised about twenty years previous to the time when the account of it was drawn up; but it now appears, from Mr. Stair's statement, that the tree was a very small plant in the year 1770, at which time Mr. Wheeler disposed of the garden in which it grew at Aldermaston, to Mr. Stair, who considered that it sprang from the seed of a tree in an adjoining nursery ground, belonging to Mr. Pendar, which tree produced fruit somewhat similar in shape, though not to large as the young plant. The garden in which the original seedling exists, is now the property of William Congreve, Esq. of Aldermaston.

May 19th, 1818. Mr. Thomas Gibbs sent a large collection of flowers of *varieties of the common Cowslip*, from his garden at Brompton. He had raised them from the seed of plants, originally derived from the wild Cowslip, which had sported into varieties, and by frequent reproduction had attained

their present excellence. Mr. Gibbs has a very large collection of these, and the flowers present a most beautiful and varied appearance. The changes that have taken place are in the magnitude of the trusses, and the size and colour of the flowers; the selection appearing to have been from the darker hues, though some paler flowers were in the collection. However great the variation was in the points alluded to, yet none of the specimens appeared to have lost the general character and appearance of Cowslip, not running either into the Oxlip or the Primrose; but some of them had become what florists term Hose-in-Hose, which appears to be the conversion, more or less, of the Calyx, into the semblance of the Corolla.

June 2d, 1818. John Barrow, Esq. of Hill Park, in Kent, presented some fruit from Barbadoes, called the *Grape-fruited Citron.* It bears some resemblance to the Forbidden Fruit, in size and colour, as well as in the flesh, but is superior in flavour. In shape the Forbidden fruit is more conical at the end next the stalk. The rind of the Grape-fruited Citron is smoother and more finely polished than that of any other Citron. They are peculiar in hanging in large clusters on the trees, from which circumstance they derive their name. Our late Member, Mr. George Anderson, observed this beautiful variety of the Citron at Barbadoes, where it is grown plentifully; it is singular that it should not have been brought much earlier into notice. The fruits exhibited by Mr. Barrow were taken from trees growing in rich black mould, with a substratum of clay, which soil seems best suited to them. The plant in Barbadoes is considered to produce fruit more

readily, and to be hardier, than any other of the Orange or Citron tribe, it may therefore be expected to succeed well in the green-house.

JULY 7th, 1818. The Reverend WILLIAM WILLIAMSON, of Westbere, near Canterbury, communicated an expeditious *method of destroying Ants,* which may be easily adopted where those insects become troublesome, or are injurious to plants. He stops the holes at the bottom of small garden pots, and places them inverted, on the spot frequented by these insects, which soon take possession of the interior of the pots, and may then be readily destroyed therein, by hot water. The ground whereon the pots are placed, should be kept rather moist. There are two sorts of Ants which are found in forcing-frames, the red and the black; the former are easily got rid of by introducing the large black Ant of the woods, which will leave the frames when the red Ants are destroyed, but they are not able to overcome the latter; for the removal of these, the above remedy has been found efficacious.

At the same Meeting, JOHN CRESSWELL, Esq. exhibited *Sarracenia purpurea,* in fine flower; in health and vigour it much surpassed the ordinary appearance of the plant treated in the usual manner. Mr. CRESSWELL's method of managing the plant is as follows: it is planted in a mixture of the fibrous roots, obtained from peat earth, with an equal quantity of rotten willow wood, broken into small pieces, by which the soil is kept perfectly drained. The pots in which the plants grow are kept in a shaded part of the stove, and watered occasionally but they do not require to be placed

in pans of water, except they become so dry as not to absorb the water given in the usual way.

July 21st, 1818. Edward Barnard, Esq. brought from his Garden at Vale Mascal, in Kent, specimens of *Piccatee Carnations* raised by himself from German seed. In brilliancy of colour as well as size of flower, these were very superior; one flower in particular measured eleven inches in circumference. The flowers were chiefly yellow, varied with different shades of crimson, scarlet, purple, slate colour, and black. Mr. Barnard makes the following observations on the treatment of these foreign Piccatees. "The seeds should be sown in the middle or latter end of May. When the plants are rather more than two inches high, they should be planted out in rows, at the distance of nine inches; they must be sheltered from excess of rain and severe frosts, during the winter, and they will blow in the course of the following summer. Plants thus raised from foreign seed generally grow luxuriantly until after they have bloomed, but the layers of the choice sorts, when propagated, are much more tender and difficult to preserve than the common English varieties, as they suffer in a much greater degree from the effect of damp during the winter. All the layers of some varieties die in the course of the succeeding spring, while the others are only kept alive by great attention, without the possibility of increasing them to any extent. Whenever the strength of any of the plants will admit of it, it is desirable to take off some shoots for pipings; as they frequently endure the winter better than plants raised by laying, although they will not produce so great an increase in the following season.

It is recommended not to keep the layers in pots during the winter, as they appear to succeed better by being planted in a frame under a south wall, in a border composed of one half rich garden mould, two-sixths light loam, and one sixth coarse grit. Towards the beginning of April they may be planted in a bed for blooming them, made up with one half maiden loam, two-sixths very rotten dung, and one-sixth coarse grit. The bed should be hooped in order that mats may be thrown over for the protection of the plants during the cold nights of April and May, or even later, as the season may render necessary. In all other respects, the general rules for the treatment of Carnations may be considered as applicable to these plants. They certainly require constant and particular attention, but the florist who succeeds in cultivating them will be amply repaid for all the trouble he bestows upon them, although he must be prepared to meet with more than usual disappointments and difficulties."

August 4th, 1818. John Wedgwood, Esq. communicated an easy and cheap method of *destroying the Aphis Lanigera*, or American blight on Apple trees, which he has practised with success. Potash and quick lime in equal quantities are brought to the consistence of cream, being dissolved in water. The mixture, whilst hot, is laid on the stem and branches of the tree with a brush, rubbing it well into the crevices of the bark, which should be scraped and cleaned before the wash is applied. It may be used in the autumn, or during the winter, whilst the branches are destitute of leaves; it will effectually kill the insects, and consequently prevent their appearance in the succeeding spring.

At the same Meeting, Mr. John Wilmot, of Isleworth, exhibited *two undescribed Plums,* both of which must be considered as new fruits. The first was a Green Gage, growing on its own root; the fruit was very large, and high coloured, much superior to the common standard Green Gage. The plant was found by Mr. Wilmot, growing in his garden at Isleworth when he first occupied it, in the year 1810; he was much pleased with the appearance of the fruit, and more so when he observed that the tree had not been worked: he consequently preserved it. The second was a new variety of Orleans Plum, from a standard tree raised by Mr. Wilmot himself, about ten years ago; this seems likely to be a great acquisition to the market gardeners; it is earlier than the Plum called the New Orleans, and as large as the Old Orleans, but differing in shape from it, being rather more contracted at the top; it is a certain bearer, in consequence of its producing its bloom so much later than others of its kind; when most of the early flowering Plums have set their fruit, and the bloom of others is fully expanded, the blossoms of this kind are not even opened. These Plums will probably be hereafter called the *Isleworth Green Gage,* and *Wilmot's Orleans.*

September 1st, 1818. Abraham Hawkins, Esq. of Alston, near Kingsbridge, in Devonshire, communicated a note of his success in treating the *Gnidia simplex,* as an outdoor shrub; in the spring of 1816, he turned a small plant of it into an open border, ten feet distant from the front of a wall facing the south-east. It is now full three feet high, and about the same in diameter, forming a very handsome

bush, covered with a profusion of its sweet yellow blossoms, of which it has yielded a succession throughout the summer.

September 15th, 1818. Sir Thomas Frankland sent some *parchment and wood labels*, which had been attached to plants, and exposed to the weather since the spring. The names of the plants had been originally written on them, on some with Indian ink, and on others with common writing ink; the latter had become quite illegible, whilst the former were as perfectly clear, as when first written.

At the same Meeting. Some *Shropshire Damsons*, produced by plants growing on their own roots, were exhibited. The trees are good bearers, and the fruit is very superior in size, and much preferable in all points to the common Damson. They are much cultivated in the county from whence their appellation is derived; and as they throw up suckers plentifully, are easily increased.

October 6th, 1818. *Two pots of Vines* bearing fruit, were received from Peter Marsland, Esq. of Woodbank, near Stockport. They were only one year old. Mr. Marsland states, that in his Vinery (which is heated by steam), Vines bear fruit in this way in great perfection. The pots are placed on stages, and when the fruit is cut, they are removed from the house, and others brought in, by which means a succession of fruit is kept up during eleven months of the year. Plants from one to four years old are used, and at the latter age they bear as large bunches, and as abundantly, as when trained to rafters. When a Vine planted in a house is made to fruit at an unusual time, it is seldom found to

bear fruit well in the following season; which is a serious inconvenience when the Vine plants are large; but when they are kept in pots, they can be replaced at little expense, and without trouble: therefore in the method practised by Mr. Marsland, the same objection to the forcing of Grapes throughout the year does not apply.

At the same Meeting. George Isaac Call, Esq. sent from his garden, near Taplow, a very large *Gourd;* it measured four feet ten inches in circumference, and weighed one hundred and three pounds. Two other specimens of the same kind were exhibited at subsequent Meetings; one by George Caswall, Esq. from Sacombe Park, in Hertfordshire, weighed one hundred and four pounds; the other had been imported from America, and was presented to the Society, by John Moxon, Esq. It weighed one hundred and forty pounds. This Gourd is the *Potiron Jaune,* of the French gardeners. It is used in France in soups, as well as mashed as a vegetable, in the manner of Potatoes, and also for pies. It keeps well during most of the winter, and is very thick in flesh. When mashed, it has a flavour very pleasant, and peculiar to itself; it is an excellent substitute, as a variety, for Carrots or Turnips. Its cultivation ought to be encouraged as a useful article of food for cottagers. It is nearly globular, very slightly ribbed, of a pale buff, or salmon colour, and thickly reticulated over its whole surface, with narrow vermicular processes. It seems sufficiently hardy to admit a treatment exactly like a common Gourd, growing best in a fresh loamy soil, well enriched with manure. The Potiron jaune, when of the size of a turkey's egg, is also a very pleasant vegetable; it should be

thoroughly boiled, and the inside, when spread on toast, and dressed with melted butter, pepper, and salt, is an excellent substitute for marrow.

At the same Meeting. Sir JOSEPH BANKS sent two *Sweet Potatoes,* one raw and the other dressed. They had been brought from Lima, and given to Mr. BULLOCK. During the voyage some of the roots were put into the water, and grew well, spreading over the sides and top of the ship's cabin, like a Vine. The boiled one was tasted, it was sweet and agreeable. This is understood to be the true sort of Sweet Potatoe, being the best variety of the *Convolvolus Batatas.* The tubers are of a pale brown colour, irregularly pear-shaped, about fourteen inches in circumference, and four inches from the point to the head of the tuber. They are the Potatoes of SHAKESPEARE, and the writers of his age; having been formerly imported from Spain, and sold in our markets before the Potatoes *(Solanum tuberosum)* now used were known.

At the same Meeting. Mr. JOSEPH KIRKE brought *Royal Muscadine Grapes, grown on standard Vines,* in his garden at Brompton. The plants from which these Grapes were gathered are from three to four feet high, and are planted in a row in front of a south wall, seven feet from the wall, and three feet from each other in the row. The fruit was well ripened, highly flavoured, and in appearance, equal to specimens from a wall. Mr. KIRKE states the crop produced on an average by every ten plants, which occupy thirty feet in length, to be forty pounds, or four pounds to each plant. The present summer has no doubt been peculiarly

favourable to this method of growing Grapes; it appears to have perfectly succeeded, and must be considered as a proof that the Vine may, in particular seasons, be cultivated as a standard with success in this country, in a favourable situation. Mr. Kirke's garden does not possess any very peculiar advantages; it may therefore fairly be inferred that the accounts we have of the growth of Grapes in this country in former times are more deserving of credit than has usually been allowed; for if they have been produced now in a warm border, why may they not have equally succeeded heretofore, especially as the absence of the artificial means we possess of ripening Grapes must have stimulated the attention and care of the cultivator more powerfully, who could then only obtain them by skilful treatment in the open air.

At the same Meeting. Some *Tripoli Onions*, grown by a gentleman in Norfolk, were exhibited. They were sown in the spring, and not transplanted, were kept whilst growing, sufficiently wide apart by repeated thinnings, and were copiously watered with common well water; the ground was in a good state as to manure, but had received no peculiar preparation. Though the plants had been so much thinned, still they were left so as to prove a large crop. They were the finest sample of Onions shown to the Society this season, being as large as the best imported Portugal Onions, weighing on an average twenty ounces each, and much superior to others which had been lately exhibited to the Society, as grown from autumnal sowings. The success of this crop appears to have resulted from the attention given to the

thinning of the plants, the daily abundant watering, and the powerful effect of the sun, which, where watering was not equally copious, destroyed the Onion crop even in the same garden, the soil of which is light, and very favourable for growing this bulb.

At the same Meeting. WILLIAM PADLEY, Esq. sent from the Royal Garden at Hampton Court, some *Galande* and *Red Magdalen Peaches,* produced on trees in pots, which had been forced in the spring; they bore their first crop in May: when the fruit had been gathered from them they were put out, and soon cast their leaves. After remaining some time in a state of rest, they vegetated and blossomed afresh, and setting their fruit well, were placed in the Pine stove in the beginning of September, and yielded *a second crop* of very good Peaches. It is very common with early forced Cherry trees to bear a second time in the same season, but with Peaches it is unusual; the extraordinary heat of the season must have caused this singularity.

OCTOBER 20th, 1818. JOSIAH TWAMLEY, Esq. sent from his garden at Warwick, three sorts of Apples, to shew the *effect of ringing the bark of the trees;* this had been singular and extraordinary. The trees were operated upon by Mr. TWAMLEY himself, last spring, and the fruit sent up were the finest of those produced on the ringed and unringed branches. In the French Crab, the fruit by ringing was increased to more than double the size, and the colour of it was much brightened. In the Minshull Crab the size was not increased, but the appearance of the Apple was so improved as to make it truly beautiful, its colours, both red and yellow,

were very bright. In the third kind, which on examination, proved to be the Court-pendu, the improvement was still more conspicuous, the colours being changed from green and dull red, to brilliant yellow and scarlet.

LXVIII. *Account and Description of the different* Varieties *of the* Onion. *By Mr.* Charles Strachan, *Gardener to the Horticultural Society of London.*

Read March 2, 1819.

Having been instructed by the Garden Committee, in the last spring, to grow all the *varieties* of *Onions* which were known in our gardens, in order to distinguish the characters and properties of each sort, and to ascertain, if possible, the true and proper names which should belong to them, I was supplied with collections of seed from several of the principal seedsmen in the metropolis, all of which were sown, without regarding the repetition of the same names in the different collections. Seeds of six French kinds were also obtained for the Society from Paris, two of which appear not to have been generally known here; the other four kinds were similar to what we before possessed. Of the English varieties forty-three distinct parcels were sown; in the various collections which were given to me, there were upwards of twenty different names, purporting to be of as many different kinds. It will appear that I consider these as reducible to a much smaller number, since, even with the addition of foreign kinds, I make only fourteen varieties; having ascertained that several different names have hitherto been given to the same sort. It will be recollected, that the last season, by reason of the drought and heat, was very injurious to Onions, on

which account the experiment with which I was charged could not be conducted with all the advantages which a more favourable year would have afforded. This circumstance will therefore, I trust, excuse errors in this account, which subsequent observation may make it necessary to correct; but as all the sorts described were cultivated together, and consequently equally subject to the unfavourableness of the season, the observations founded on comparison between them will be less likely to be incorrect. Perhaps the want of a due supply of moisture to the bulbs might occasion them to take a higher colour than would belong to them in a more rainy season, in which they would also attain a greater size, and on that account be also generally paler, and their strength of flavour be diminished.

The common Onion is the ***Allium Cepa*** of Linnæus, the regular varieties of which are the chief object in this paper. The same genus supplies our kitchen gardens with the following, viz. the ***A. sativum***, or ***Common Garlic***; ***A. Scorodoprasum***, or ***Rocambole***; ***A. Ascalonicum***, or ***Shallot***; and ***A. Schænoprasum***, or ***Chives***; all of these more peculiarly belong to the herb garden. There is besides, the ***A. Porrum***, or ***Leek***, which must be considered as a distinct vegetable, and therefore not requiring notice here.

But there are three other plants belonging to the genus, which though not exactly falling under the description of the common Onion, ought to be described, for, as they are known to gardeners as Onions, a general account of the vegetables so called, would be imperfect were they not included in it; these are, the ***Welsh Onion***; the ***Underground***, or ***Potatoe Onion***; and the ***Tree***, or ***Bulb-bearing Onion***.

1st. *The Silver-skinned Onion.* There seems to be no difference amongst cultivators, in the name of this kind. It is the *Ognon Blanc Gros* of the French. Its shape is flat, its size middling, and its colour a shining white; the skin is very thin, and as the bulb ripens in the bed, it splits, and shows a fine veined green in the second skin. In this kind two bulbs are often formed on the same root, which rarely happens in others. In quality, it is mild, and if well ripened will keep tolerably, though it is usually considered as an early Onion; but its chief use is for pickling. The seed of this Onion is never saved well in England, it is therefore always imported from Holland for the supply of the seedsmen.

2nd. *The early Silver-skinned Onion.* This is a new sort, which has been sent to us from France, under the name of *Ognon Blanc Hatif.* Mr. Malcolm noticed this Onion as remarkably fine, and abundant, in the market of Paris, in June last. In shape and colour it resembles the former, but its size is less; it grows entirely on the surface of the ground, having its fibres and leaves very slight; it is fit for use full six weeks before all the other sorts, which is its great excellence; for when kept, its flavour becomes stronger than that of the common Silver-skinned Onion.

3rd. *The True Portugal Onion.* This was raised from seeds presented to the Society by James Warre, Esq. they had been imported by himself from Lisbon. It is the Onion which comes from Portugal, and is so abundant in the shops of the fruiterers in London early in the winter. Amongst all the different kinds which were supplied for the garden last spring by the seedsmen, there was none that exactly resembled this Onion. I believe it has not been customary to import the

seed from Portugal as an object of trade, which will account for its not being found in the shops; for as the sort is unquestionably tender, it would not answer to save the seed at home. The Portugal Onion varies in its shape, but it is usually flatly globular, and grows to a large size in rich and moist soils; the colour of the outer skin is brown, which falling off, shows beneath it a fine green, with a smooth surface. The fibres of the root are very strong, and the tops are large. Whenever this kind is grown it should be used early, for it will not keep till the spring. The large roots which I grew were remarkably mild, but the smaller ones, being more ripened, were less so.

4th. *The Spanish Onion.* The *Ognon d'Espagne* of the French. In the English gardens it is known under the various names of the *White Spanish,* the *Reading,* the *White Reading,* the *Portugal,* the *White Portugal,* the *Cambridge,* the *Evesham,* and the *Sandy Onion.* It is very commonly known by the name of the *Reading* Onion; the soil around that town being peculiarly well adapted for the growth of Onions, and this kind being much cultivated there, has caused it to acquire that appellation. Its other provincial names arise from a similar cause. It appears to be derived from the true Portugal Onion, accommodated by frequent reproduction from seed, to the climate of this country. Its shape is flat, its size is large, and its colour is white, tinged with green; the outer or loose skin gives it a brownish appearance at first, but when that falls off, which it does spontaneously, the next coat appears varied green. This is the best Onion for a general crop, for early winter consumption, its size makes it useful, and it is also particularly mild; but it has not the keeping quality of some other kinds. It is very much cultivated by gardeners.

5th. *The Strasburg Onion.* The seed of this is usually imported from Holland every year, and hence it is sometimes called the *Dutch* Onion, and the *Flanders* Onion. The *Essex Onion* is this kind produced from seed saved in that county. Its shape varies from flat to globular, and may be generally described as oval; its size is large, and its colour, when divested of its brown external coat, light red tinged with green. The fibres of the root are matted and thick; the bulb in growing takes strong hold of the ground, being full two-thirds below the surface; the skin is rough and thick, which gives it a coarse appearance. This is a hardy sort, keeps well, but is strong. The Deptford, Globe, and James's Onion, which I shall next describe in succession, appear to be sub-varieties, derived from it. The Strasburg Onion is the sort most generally cultivated through the kingdom, perhaps in double the quantity of all the others. It is also often sown in the summer for early spring green Onions; it roots well, and is sufficiently hardy to bear the severity of ordinary winters.

6th. *The Deptford Onion.* Its shape is globular, its size middling, and its colour pale brown, without any tinge of red; its skin is smooth and thin. It is mild when compared with other hardy Onions, and it keeps better than the Spanish. It is the Onion principally grown in the neighbourhood of London, and next to the Strasburg Onion, is most in use.

7th. *The Globe Onion.* Is of globular shape, rather more so than any other; its size is large, and its colour pale brown, with a tinge of red; its skin is rough and thick. It keeps well, and is mild flavoured, but the coarseness of

its skin deteriorates its value. It is a hardy Onion. This and the Deptford Onion, commonly yield good crops, which accounts for their great popularity amongst gardeners.

8th. *James's Keeping Onion.* This is a well known sort. It was raised by a market gardener of the name of JAMES, several years ago, in Lambeth Marsh. Its shape is pyramidal, and size large; the colour of the outer skin is brown, the second skin has a reddish cast. It is very hardy, the bulbs grow on the surface of the ground, and it keeps particularly well; it is, however, strong in flavour.

9th. *Pale Red Onion.* The *Ognon Rouge Pâle* of the French. Among our English seeds was the *Amiens Onion*, which turned out to be this kind. The shape of this Onion varies from globular to flat, but the bottom of the bulb is usually particularly flat; it is never large, and its colour is a pale red; it grows on the surface of the ground, ripens early, is a hard sound Onion, keeps well, and has a strong flavour. This kind has also probably been derived from the Strasburg or Dutch Onion, and seems inferior to others with the same characters.

10th. *The Yellow Onion.* Received from France as the *Ognon Jaune*, and if not entirely unknown in our gardens until the present time, has certainly been little grown. It is of a globular shape, small size, and yellowish-brown colour, but more inclining to brown; it grows much under ground, ripens early, keeps well, and is strong flavoured; its best use is as a pickle, for which its hard firm texture well adapts it.

11th. *The Blood-red Onion. The Ognon Rouge Foncé* of the French, and with us also called the *French Blood-red*, and

the *Dutch Blood-red,* as well as the *St. Thomas's Onion.* Its shape is flat, and size middling; the colour is a deep red, which sufficiently distinguishes it from all others. It is a very hardy, sound Onion, keeps particularly well, but is strong. It is much grown in Wales and in Scotland. In the London market, it is in demand for its medicinal properties, being a strong diuretic.

12th. *The Tripoli Onion.* This sort is not so well known amongst gardeners as its peculiar merit, in some points, deserves. It is much the largest Onion grown, and is very different from all others in shape, for it tapers nearly as much to the base of the bulb as to the top, thus becoming almost oval, though in some cases, I have seen it flat. Its colour is light red, tinged with green and brown. It grows almost entirely out of the ground, little else but its fibres being buried in the soil. It is a soft Onion, and will not keep long after it is taken up; but as long as it lasts, is excellent on account of its mildness.

13th. *The Two-bladed Onion.* This is a new sort with us. It is of a shape inclining to flat, of middling size, and of a green colour, after its light brown coat falls off. The tops of this kind are very small, with little foliage, the smaller bulbs having sometimes only two leaves (whence it derives its name) but the larger ones do not possess this peculiarity, though the number of leaves is always small. Its bulbs ripen early, are hard, sound, and keep well, but are strong. If the very small bulbs of this kind saved from the preceding year, are re-planted in the spring, instead of running to seed, they will swell and ripen, becoming fine sized Onions,

before any can be obtained from either autumnal or spring sowings of other kinds; on this account the two-bladed Onion is particularly valuable.

14th. *The Lisbon Onion.* This has been called the *Early Lisbon*, and the *White Lisbon Onion.* It varies in shape, but is for the most part, globular; it attains to a large size, and is of a bright white colour, its skin being smooth and thin. It grows about two-thirds below the surface of the ground, and has very strong fibres, with a coarse thick neck, and large leaves which preserve their verdure late. It is slow in coming to maturity, so that if sown in the spring, at the same time with other Onions, it will not ripen well; but though tardy in ripening, it is hardy, and is therfore much used for autumnal sowing, for which purpose it is preferable to the Welsh Onion, because it is milder as a green Onion in spring salads. The plants of the autumnal sowing, which are not destined for spring use, do well if pricked out from the seed-bed in April; they then form fine large bulbs, which ripen well in the autumn. The seed of this Onion is always imported, principally from the South of France.

I apprehend that the fourteen kinds of Onions above described, are all that can be considered as distinct varieties; for though I am aware of several Onions, the names of which are to be found in printed catalogues of garden seeds, as well as in the shops of seedsmen; yet I have little doubt that when such are grown, they will be found referable to some one of the preceding kinds. In the *Bon Jardinier* for 1818, two sorts are mentioned, which I did not receive from France, the *Ognon Pyriforme*, and the *Ognon Blanc de Florence;*

I conjecture, from the shape of the first, that it is our Tripoli Onion, and from the character and mode of cultivation of the latter, that it is the Lisbon Onion.

The Welsh Onion, the *Allium fistulosum* of Linnæus. It is also called by Miller *Ciboule*, which is its French name. This is a native of Siberia, and being perfectly hardy, is commonly sown in July or August, to stand the winter, and furnish small green Onions for salads in the first spring months. It is the *Allium* of Pallas, and has been figured in flower in the *Botanical Magazine*, plate **1230**. It is remarkable for its hollow leaves and stems; it has long tapering roots, and strong fibres. Why it has been called the Welsh Onion, I have not ascertained. It is so distinct from the common Onion, that it is impossible it can be confounded with any of its varieties. It never forms a bulb, and is an herbaceous perennial. The Welsh, as a spring Onion, is strong, but it is so hardy that it will stand the severest winter with little care. I have already noticed that the Strasburg and Lisbon Onions are sown frequently in autumn for spring crops; the Deptford and also the Spanish are sometimes used for the same purpose, but are liable to destruction by frost. As a crop, the Welsh Onion is entirely consumed in the spring, and early in the summer, with the exception of the few roots which are reserved for the production of seed, which it bears most abundantly. In France they have two kinds of the Ciboule, the white and the red.

The Under-ground, or *Potatoe Onion*. This, if it be a variety of the common Onion, as it is generally considered, has a singularly different property. It multiplies itself by the formation of young bulbs on the parent root, and thus pro-

duces an ample crop below the surface. It seems to be coming more into use, as it becomes more known. It is a strong Onion, but its greatest advantage is that the bulbs being formed and matured very early in the year, the gardener is thereby possessed of a full grown ripened Onion at a time when all those of the preceding season have perished, and before the new crops are ready. It is unnecessary to go more into detail respecting it, an account of it by Mr. MAHER being already printed in the *Transactions* of the Society.*

The Tree, or *Bulb-bearing Onion.* This had long been erroneously supposed to be a species, (Allium Canadense,) distinct from the common Onion; it was however figured in the *Botanical Magazine*, plate 1469, as a variety of Allium cepa, and in a note added by Mr. GAWLER to page 1635 of the same work, the cause of the error, as well as the origin of the variety, is very satisfactorily made out. It seems that the Tree Onion is met with in the gardens of Canada, the climate of which country being too cold to allow it to flower and seed freely, it became viviparous (bearing bulbs instead of flowers) and retained its habit when brought here. The A. Canadense is a distinct species, and as this variety came from Canada, the cause of its erroneous denomination is evident, The Tree Onion is called by the French *Ognon d'Egypte.* It is perhaps more an object of curiosity, than real use; the small bulbs, however, are excellent in pickles, for which their diminutive size is well adapted. It is necessary to plant the bulbs fresh each spring to obtain a crop; the old roots produce a few offsets below the surface of the ground as well

* See page 305.

as the crop of young bulbs on the head of the flowering stem.

The denomination of *Scallions* is given to the strong green tops of Onions in the spring and summer, and generally all Onions which do not bulb but form lengthened necks, are called Scallions. The plants of any Onions which have been sown in autumn and become strong and large in the spring, are thus called amongst the market gardeners round London, and the shoots of any Onion of the preceding year replanted in the spring are usually named Scallions. If it were necessary strictly to point out what was intended by the old gardeners for the Scallion, I should not have hesitated to apply the term to the Welsh Onion, in its enlarged spring state; but a difficulty occurs in thus fixing it, because Miller, in his Dictionary, speaks of the Scallion, as distinct from the Welsh Onion, noticing both; his description of the Scallion is perfectly applicable to, and agrees with the Welsh Onion, but he says that the true Scallion, however much in use formerly, was in his time nearly lost, and only to be found in curious Botanic Gardens. If it has not entirely disappeared, which is not improbable, and if it be a distinct species of Allium, we have at least lost the knowledge of what plant it is, to which the term should be properly given.

LXIX. *On the* Classification *of* Peaches *and* Nectarines, *with Observations on the Disorders incident or peculiar to each Class. By Mr.* John Robertson, *of Kilkenny, Corresponding Member of the Horticultural Society.*

Read July 7, 1818.

As the *classification* of fruits, by systematic arrangement, forms a subject which occupies the attention of the Horticultural Society, I beg leave to communicate to it, the method I have adopted and followed these many years past, to ascertain with correctness, the kinds of *Peaches* and *Nectarines* I cultivate in my nurseries; and hope that it may, in some degree, tend to facilitate the attainment of the object, which the Society has in view.

Aware of the necessity of establishing my system upon accurate principles, in order to reduce the different varieties within well defined boundaries, under separate heads; and finding that the distinctions afforded by the fruit alone, were, from its variable nature, insufficient; I had recourse to the tree, to supply other characters which might, in conjunction with those contributed by the fruit, of form, colour, &c. enable an enquirer to ascertain, with little difficulty, the true place of any individual fruit, which might come under his observation.

Availing myself, therefore, of the assistance of the leaf and flower, I separated the *Families* of Peaches and Nectarines, into *Classes, Divisions*, and *Subdivisions*, taking the distinctive character of the classes from the leaf, as being the most

permanent and obvious; of the divisions from the flower; and of the subdivisions, from the fruit: thinking it better to confine the attention to a few striking characteristics, recommended by their permanency and precision, than to distract, by a greater number. I consequently formed the following synoptical table, which is applicable to either Peaches or Nectarines.

Class I. Leaves furnished with glands.	Division I. With large open light coloured flowers.	Subdivision I. With flesh parting from the stone.
		Subdivision II. With flesh adhering to the stone.
	Division II. With small deep coloured flowers.	Subdivision I. With flesh parting from the stone.
		Subdivision II. With flesh adhering to the stone.
Class II. Leaves without glands.	Division I. With large open light coloured flowers.	Subdivision I. With flesh parting from the stone.
		Subdivision II. With flesh adhering to the stone.
	Division II. With small deep coloured flowers.	Subdivision I. With flesh parting from the stone.
		Subdivision II. With flesh adhering to the stone.

To each kind, when thus classed, I give a minute and particular description of the fruit, as in the following in-

stance of Red Magdalen Peach, which belongs to Subdivision 1, of Division 2, of Class 2. Shape, nearly round; its transverse diameter about two and a half inches, its longitudinal diameter, from eye to stalk, about two, and its circumference, sometimes amounting to twelve inches; cavity at the stalk, wide but shallow; cleft also shallow, but well marked; skin, of a purple or deep red to the sun, and of a light green from it, but speckled with red all over; flesh reddish to the sun, greenish from it, highly flavoured, and full of juice, &c. &c.—If any peculiarity belongs to the wood, leaves, &c. it is added.

The glands, by whose presence or absence the classes are denominated, are seated, two or more, on the base of each leaf, at the junction of the footstalk; they are usually about the size of a pin's head, and secrete a honeyed juice; the leaves on which they are found, are, in general, rather more lanceolate, and of a more dense and firm substance, smoother on the surface, and have more regular and fine serratures on their edges; they are constant in such varieties as possess them, and appear to be the result of a peculiar and uniform organization of the plant, which may perhaps be continued without variation from the seed.* The leaves without glands are rather more ovate, of a thinner and more delicate substance than the former, and more deeply and irregularly serrated.

Both classes are strongly contradistinguished by a liability to some diseases, and an exemption from others; the

* May they not have sprang more immediately from the Almond, which is distinguished by Linneus, from the Peach, by the glands on its leaves?

glandular being subject to that species of blight, indicated by a blistered and monstrous growth of the leaves and shoots, but not to the mildew, in any injurious degree. The class without glands is generally free from the blister, but liable to the curl in the leaves, and tops of the shoots, to the attacks of aphides, and to the mildew: it is also more hardy in its habits, and consequently better adapted to a raw moist climate.

Amongst the gland-bearing Peaches, may be reckoned the red Nutmeg, the Alberge, the Admirable, and most of the sorts called French Peaches, as Mignonnes, Chevreuses, Galandes, &c. Amongst the glandless, are the Early Anne, the Magdalen, the Noblesse, the Montauban, the Newington, &c. The Nectarines are mostly glandular; the only one which I have met without glands, being the Newington.* Perhaps the same law of organization, which gives birth to smoothness and thickness in the leaf, may have a greater tendency to form a firm substance, and smooth skin in the fruit; rather than a tender pulp and downy coat, the latter being but a further developement of the former qualities.

A Nectarine has been found to grow on a Peach tree; I am inclined to conjecture, that it was on one with a glandular leaf, and that if ever a Peach shall appear on a Nectarine tree, it will be on one with glandless leaves.

Every attempt to reduce varieties, the sport of nature, to systematic order, must be liable to imperfection; but I hope that these outlines may assist in lessening the confu-

* Not noticed, I believe, by the French.

sion which the nomenclature of our fruits at present labours under, often unavoidably subjecting the nurseryman to unmerited censure, and his customer to loss and disappointment: it is also hoped that the gardener may derive some immediate advantage from the knowledge that the gland-bearing Peaches and Nectarines are not liable to be injured by the mildew; as he will, in consequence, be better enabled to select such sorts, as shall be fit for situations subject to that disorder.

Note by the Secretary.

Two French writers on gardening, viz. M. POITEAU, in the *Bon Jardinier*, and the Count LELIEUR, in his *Pomone Francaise*, have formed a classification of Peaches and Nectarines, on the same plan as that described in the preceding pages. Mr. ROBERTSON was not acquainted with these works, when he communicated his Paper to the Society; his arrangement differs materially from either of them, being less minute in its divisions; and the inferences relating to the disorders of the trees of each of his classes, appear to have escaped the notice of the authors above mentioned.

Synoptical tables, in which are arranged all the Peaches enumerated by M. POITEAU, and by the Count LELIEUR, respectively, are annexed, to elucidate the following comparison of the respective methods of the three writers. They all agree in forming their first division into what Mr. ROBERTSON calls the *Families* of Peaches and Nectarines, the former being termed by the French *Pêches Duveteuses*, or Downy Peaches, and the latter *Pêches Lisses*, or Smooth

Peaches. The Second Division (the *Classes* of Mr. Robertson) is by him founded on the absence or presence of glands on the leaves: with the French writers, it is formed by that quality of the flesh of the fruit which allows it to part readily from, or to adhere to, the stone; the fruits having the latter quality, being generally termed by the French, *Pavies.* The Third Division (the *Divisions* of Mr. Robertson) is by all three writers made according to the size of the flower; the French, however, making three partitions of the size, into large, middle-sized, and small flowers, whilst Mr. Robertson has only large and small flowers. The Fourth, and last Division (the *Subdivisions* of Mr. Robertson) is by him founded on the disposition in the flesh of the fruit to part from or adhere to the stone; whilst, with the two French authors, it is formed on the presence or absence of glands on the leaves, these being by them both subdivided into globose and reniform shaped glands. The Count Lelieur adds a still further head of distinction, founded on the serrature of the leaves, but an inspection of his table will shew this to be entirely unnecessary; since, agreeably to the observation made by Mr. Robertson, the gland-bearing leaves have all small serratures, and the glandless leaves large serratures.

In order to elucidate the subject still farther, an arrangement has been made of all the Peaches introduced into the Count Lelieur's table, in a Synoptical table, on the plan of Mr. Robertson, which is annexed; this has been readily done by means of the characters given by the Count Lelieur, without reference to the trees themselves. The only difficulty in the way of making this transfer perfect, arose from the triple division of the size of the flower, by the

French writer: this has been obviated, by uniting his trees with middle-sized and small flowers, under Mr. Robertson's division of small-sized flowers.

The subject of Mr. Robertson's communication, as well as the comparison of his system with that of the French writers, will no doubt be hereafter attended to, and farther elucidated; the chief difference between them is in the preference given by Mr. Robertson, in the formation of his Classes, to the glands, rather than to the quality of the fruit. If, in all arrangements of this nature, the greater divisions, (in order to facilitate the ascertaining the place of any unknown individual) ought to be founded on properties which are more lasting as well as most obvious, the preference, in this case, ought surely to be given to those which are annexed to the foliage.

I. M. POITEAU'S SYNOPTICAL TABLE OF PEACHES.

- **DOWNY PEACHES** *(Peaches.)*
  - with flesh parting from the stone
    - having large flowers
      - with globose glands on the leaves
        - Mignonne hâtive.
        - Mignonne frisée
        - Grosse Mignonne
        - Vineuse de Fromentin
        - Belle Bausse
        - Belle Beauté
      - with reniform glands on the leaves
        - Pourprée hâtive
        - Pêcher à Fleurs doubles
        - Abricotée
      - without glands on the leaves
        - Avant blanche
        - Madeleine blanche
        - Pêche de Malte
        - Madeleine de Courson
        - Pêche d'Ispahan
        - Cardinale
        - Pêcher Nain
    - having middle sized flowers
      - with globose glands on the leaves
        - Admirable
      - with reniform glands on the leaves
        - Alberge jaune
        - Chevreuse hative
        - La Chancelière
      - without glands on the leaves
        - Madeleine à moyennes fleurs
    - having small flowers
      - with globose glands on the leaves
        - Galande
        - Boudine ou Bourdine
        - Teton de Vénus
        - Nivette
        - Royale
        - Pêcher à feuille de Saule
      - with reniform glands on the leaves
        - Chevreuse tardive
        - Petite Mignonne
  - with flesh adhering to the stone
    - having large flowers
      - with reniform glands on the leaves
        - Pavie de Pompone
      - without glands on the leaves
        - Pavie Madeleine
    - having small flowers
      - with reniform glands on the leaves
        - Pavie Alberge
        - Persèque
        - Pavie tardif
- **SMOOTH PEACHES** *(Nectarines.)*
  - with flesh parting from the stone
    - having large flowers
      - with reniform glands on the leaves
        - Després
        - Jaune lisse
    - having small flowers
      - with reniform glands on the leaves
        - Pêche Cerise
        - Violette hâtive
        - Grosse Violette
  - with flesh adhering to the stone
    - having large flowers
      - with reniform glands on the leaves
        - Brugnon musqué

II. THE COUNT LELIEUR'S SYNOPTICAL TABLE OF PEACHES.

Fruit	Flesh	Flowers	Glands and serratures	Varieties
DOWNY FRUIT (*Peaches.*)	with flesh parting from the stone	having large flowers	with globose glands on the leaves and small serratures	Mignonne hâtive; Grosse Mignonne; Grosse Mignonne frisée
			with reniform glands on the leaves and small serratures	Pourprée hâtive; Pêcher à fleurs doubles
			without glands on the leaves and large serratures	Avant blanche; Pêche d'Ispahan; Madeleine de Courson; Pêche de Malte; Cardinale
		having middle sized flowers	with globose glands on the leaves and small serratures	Avant jaune; Admirable
			without glands on the leaves and large serratures	Madeleine à moyennes fleurs
		having small flowers	with globose glands on the leaves and small serratures	Galande; Bourdine; Teton de Vénus
			with reniform glands on the leaves and small serratures	Petite Mignonne; Chevreuse tardive; Pourprée tardive
	with flesh adhering to the stone	having large flowers	with reniform glands on the leaves and small serratures	Pavie de Pompone
			without glands on the leaves and large serratures	Pavie Madeleine
		having small flowers	with reniform glands on the leaves and small serratures	Pavie jaune
SMOOTH FRUIT (*Nectarines.*)	with flesh parting from the stone	having large flowers	with reniform glands on the leaves and small serratures	Pêche Despr és
		having small flowers	with reniform glands on the leaves and small serratures	Pêche Cerise; Petite Violette hâtive; Grosse Violette hâtive
	with flesh adhering to the stone	having large flowers	with reniform glands on the leaves and small serratures	Brugnon musqué

III. SYNOPTICAL TABLE OF PEACHES FROM THE COUNT LELIEUR,

ACCORDING TO MR. ROBERTSON'S SYSTEM.

PEACHES	leaves furnished with glands	with large flowers.	with flesh parting from the stone	Mignonne hâtive
				Grosse Mignonne
				Grosse Mignonne frisée
				Pourprée hâtive
				Pêcher à fleurs doubles
			with flesh adhering to the stone	Pavie de Pompone
		with small flowers	with flesh parting from the stone	Avant jaune
				Admirable
				Galande
				Bourdine
				Teton de Vénus
				Petite Mignonne
				Chevreuse tardive
				Pourprée tardive
			with flesh adhering to the stone	Pavie jaune
	leaves without glands	with large flowers	with flesh parting from the stone	Avant blanche
				Pêche d' Ispahan
				Madeleine de Courson
				Pêche de Malte
				Cardinale
			with flesh adhering to the stone	Pavie Madeleine
		with small flowers	with flesh parting from the stone	Madeleine à moyennes fleurs
NECTARINES	leaves furnished with glands	with large flowers	with flesh parting from the stone	Pêche Després
			with flesh adhering to the stone	Brugnon musqué
		with small flowers	with flesh parting from the stone	Pêche Cerise
				Petite Violet hâtive
				Grosse Violette hâtive

LXX. *On the superior Healthfulness of* Scions *taken from the Trunks of* Apple Trees, *to those cut from the extremities of the Branches. In a Letter to the Secretary. By* THOMAS ANDREW KNIGHT, *Esq. F. R. S. &c. President.*

Read April 6th, 1819.

MY DEAR SIR,

I HAVE addressed to you a bundle of Cuttings from a Golden Pippin tree, in which I have some reason to hope, that the powers of life are not so much expended by age, as in those usually employed as grafts. They were produced under the following circumstances. I purchased a small estate in a part of Herefordshire, in which the Apple tree grows with more than ordinary health and vigour, and upon it I found a Golden Pippin Tree of an extraordinary age and size, its trunk measuring more than six feet in circumference. Its young branches were, as usual, much cankered; but the trunk was perfectly free from every appearance of disease; and as I had always found, that cuttings taken from the trunks of seedling old trees grow much more vigorously than those taken from the extremities of bearing branches, I was led to think it probable that Scions, obtained from the healthy trunk of an old grafted tree, might be found to exhibit, to some extent, similar powers.

I therefore took off the branches of my old tree; and I in consequence obtained the Scions you receive. They will succeed better upon Paradise, than upon Crab, stocks.

In experiments which I made many years ago, upon this, and other expended varieties of Apples, I found that the destructive effects of canker were greatly prevented, by digging up the trees once in every three or four years, and applying some fresh unmanured mould of good quality to the roots. The growth of dwarf Apple trees, upon Paradise stocks, is little affected by this mode of treatment, particularly if such trees have been frequently removed whilst in the hands of the nurserymen, by which their roots have become numerous and short.

I do not feel *confident*, that any advantages will be obtained by using the Scions I send, instead of the others, taken, as usual, from bearing branches; but as we certainly do not possess an Apple of equal merit with the old Golden Pippin, the experiment deserves a trial, as it is easily made.

I remain,

my dear Sir,

sincerely yours,

Thomas Andrew Knight.

Downton, April 3d, 1819.

LXXI. *Observations upon the most advantageous Form of Garden Pots.* *By* THOMAS ANDREW KNIGHT, *Esq. F.R.S. &c. President.*

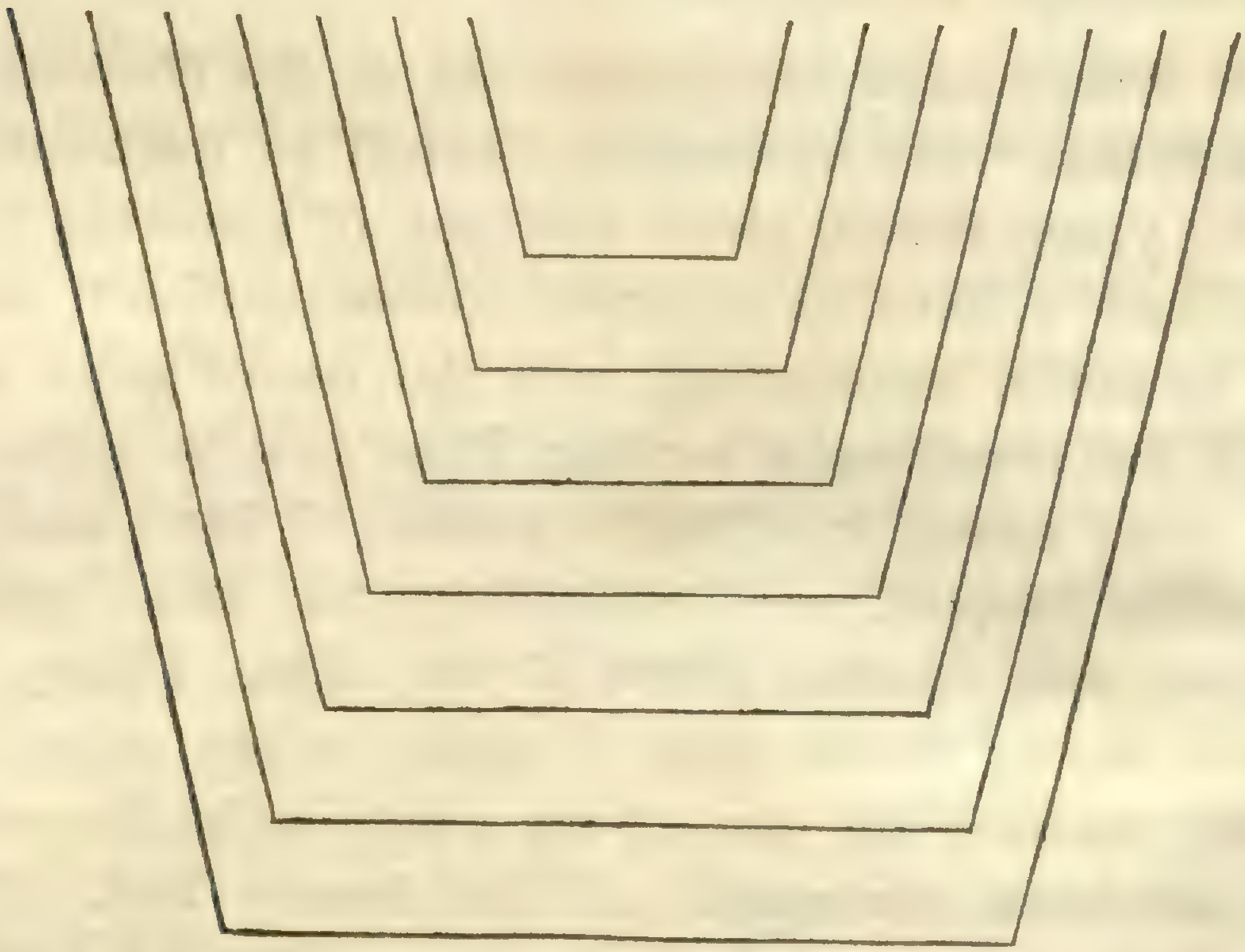
Read May 4, 1819.

MR. WILLIAMSON has pointed out, in the *Horticultural Transactions,** the advantages obtained by frequently removing young Balsam plants into pots of somewhat larger size; and I have in a former communication,† stated, that by similar management, with the use of green living turf, I had occasioned a seedling Plum tree to shoot nine feet seven inches in a single season. I have also subsequently adopted, very extensively, the same mode of practice with seedling plants of the Plum, Cherry, and Peach, having found, that I could, at the same time, greatly encrease the size of my plants in the first season, and accelerate the period of their bearing fruit. These experiments led me to endeavour to ascertain what form of Pot could be used with most advantage; and the practice of some years has induced me to adopt, exclusively, the form and proportions shewn in the annexed diagram. According to this, the width of each Pot at its top being as eight, its depth will be as six, and its smallest width, at its base, as five, inside measure; and when a seedling tree, or plant, is removed from a Pot of any given size to the next above it, a space of an inch on each side, and of an inch

* Page 127 of this volume.

† Horticultural Transactions, Vol. I. page 248.

and half below, is provided, to receive fresh mould. It is probable that for balsams, and other annual plants, when treated in the manner proposed by Mr. Williamson, in which finely reduced mould is used, pots of intermediate sizes might be employed with beneficial effects.



Scale of a quarter of an inch to an inch.

The internal dimensions of each size of Pot being pointed out in the sketch annexed, the proportional width of each, comparatively with its depth, will probably appear much greater than it will be found in the Pot itself. The width is nevertheless somewhat greater, comparatively with the depth of the pots, than is usually seen: but this I consider advantageous to the growth of the plants: for, in many

experiments, purposely made, I constantly have found the growth of trees to be most rapid when the roots and leaves are brought nearest to each other, under similar external circumstances; and the horizontal space necessarily occupied by the leaves and stems of plants will, in almost all cases, exceed the width of the pots of the form recommended. The increased breadth and diminished depth, of the mould, are not, therefore, productive of any loss, or inconvenience: whilst the gardener is enabled to remove his plants from a smaller to a larger pot with great facility, and with much less danger of injury to their roots, than with Pots of the ordinary forms and proportions.

LXXII. *Account and Description of* Wilmot's New Early Orleans Plum. *In a Letter to the Secretary. By* William Hooker, *Esq. F. H. S.*

Read August 17th, 1819.

Dear Sir,

Among the various specimens of garden produce which our indefatigable Member, Mr. John Wilmot, has this season most liberally laid on the table of the Horticultural Society, the attention of many of the Members has been particularly directed to a new variety of Plum, which appears, I think, to possess qualities, which render its possession desirable to all cultivators. I am, therefore, induced to trouble the Society with the following notice and description of it, from information obtained of Mr. Wilmot, who has named it Wilmot's New Early Orleans.*

The original tree was raised by Mr. Wilmot in his garden at Isleworth, about ten years since, and in its habit it nearly resembles the old Orleans, but the shoots are shorter from point to point, and the buds more prominent; the leaves are somewhat longer and of a rather deeper green; the flowers expand at a later period than those of most other Plums, notwithstanding its fruit ripens three weeks before that of the Orleans, and as early as the Precoce de Tours, and the Morocco.

* A short notice of this Plum, under the name of Wilmot's Orleans Plum, will be found at page 362 of this volume.

Wilmot's new Early Orleans Plum.

The fruit is above the middle size, round, slightly cleft, the skin all over of a rather dark purplish tint, when well exposed, but the shaded part is of a delicate pale red covered with a fine blue meal; the external appearance much like that of the Orleans, but the colour is generally darker, and somewhat brighter, and the form more compressed, especially at the eye; the flesh is of a rich greenish yellow, inclining to an amber tint, when quite ripe; of pleasant consistence, being much softer and more juicy than the Orleans, of excellent flavour, sweet combined with pleasant acid; the skin is slightly pungent, thin, and peels very readily from the flesh; the stone is round, rather small in proportion to the size of the fruit, and separates *clearly* from the flesh.

This variety is particularly adapted for an early supply for the dessert, and is decidedly superior to any Plum of its season, at present cultivated; the lateness of its flowering renders its crop more certain, and the habit of the tree is vigorous and fertile. Its beautiful appearance will obtain it a preference in the market, and it is well adapted for baking.

The importance of a superior early Plum is too obvious to require comment, and will be an apology, I trust, for my thus troubling you.

I am, dear SIR,

Yours very faithfully,

WILLIAM HOOKER.

York Buildings, New Road,
August 17, 1819.

LXXIII. *An Account of two* Mulberry Trees, *growing in the Garden of* Thomas William Coke, *Esq. M. P. F. R. S. &c. at Holkham Hall, Norfolk. Communicated in a Letter to the Secretary. By* Roger Wilbraham, *Esq. Vice President.*

Read August 17th, 1819.

Dear Sir,

Although it is well known that the fruit of the *Mulberry* tree is much improved by a warm situation (and even that it will bear forcing), yet it seldom happens that this advanvantage has been bestowed upon it.

The benefit derived from so doing is clearly proved by the following account, which will at least have one recommendation with our Society, namely, that of occupying a very short portion of their time.

The measurement of the trees was made, and the account of them was taken at Holkham, August 2d, 1819, by

dear Sir,

your very faithful Servant,

Roger Wilbraham.

Stratton Street,
August 12, 1819.

These Mulberry trees are trained to a trellice, upon a south wall, sixteen feet high. They occupy the whole of it, except about ten inches of coping at the top of it, and reach to within one foot of the border. The lateral extent of the

branches of one of these trees, is ninety-four feet six inches, and that of the other tree, is ninety-seven feet two inches.

They have been planted thirty three or thirty four years, and continue to grow vigorously. The Mulberries which they produce are considerably larger in size and richer in flavour than those of the common standard Mulberry tree, and their time of maturity is much earlier; they being full ripe about the middle of July, and continuing good till the beginning of October, during which time they not only furnish every day, an abundant supply for a very large family, but afford a considerable overplus, which is distributed in presents.

The gardener prunes them twice a year; the first time in June, leaving spurs of two or three inches long, which at the winter pruning he shortens to about an inch in length.

LXXIV. *Account and Description of the* Downton Strawberry: *a new Variety, raised by* Thomas Andrew Knight, *Esq. F. R. S. &c. President. By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read Sept. 7, 1819.

At the General Meeting of the Horticultural Society, in August 1818, a Paper, by the President, on the variation of the *Scarlet Strawberry*, propagated by seeds, was read, and this communication was afterwards published in the *Transactions* of the Society.* In the experiments made to ascertain the facts therein stated, numerous varieties had been produced, some of which, it was confidently expected, would prove of considerable value. In the Paper alluded to, short notices were given of a few of those, which appeared likely to justify this opinion; but as the plants had been only raised in 1817, the fruit which they had borne, at the time when these notices were drawn up, was their first; it was therefore reasonably expected, that their future produce would be much superior.

This expectation was particularly well founded in the variety described in the Paper, as Number 7, but which it is proposed hereafter to call the *Downton Strawberry*, thereby recording the place of its origin. In the middle of last July, some specimens of the present year's fruit were sent by Mr. Knight to the house of the Society,

* Page 207 of this volume.

The Downton Strawberry.

at a time when I happened to be absent from town; they were carried immediately to Mr. Hooker, on their arrival, and I am consequently indebted to him for the following description of this Strawberry.

"The fruit is large, and the form very various and irregular; I should describe it, (judging from six berries which I examined,) as very flat, ovate, and generally inclined to that kind of monstrosity which is termed the Cock's-comb; one of the berries had become quite two-lobed at its base (the calyx being inserted in a very deep hollow), and flattened, as if pressed, on its sides; it was of immense size, and very beautiful, the seeds, which are well formed, not very large, and of equal magnitude, being pretty regularly inserted, and not increased in number towards the point, as is generally the case in Cock's-comb Strawberries. The external colour is bright scarlet; the flesh has a rich yellowish hue, inclining to red, and is of a complete buttery consistence, without core or hollow space, exquisitely rich and abounding with juice, far excelling any other Strawberry I have ever tasted, though I could not discover in it the peculiar aroma of the Pine Strawberry; yet the very intense sweet being combined with agreeable and rather powerful acid, gives it a very decided character."

Specimens which have been subsequently received, as well as the opinion of several gardeners, who have tasted the fruit at Downton, this summer, confirm the account given of this Strawberry by Mr. Hooker, who has also been enabled to execute a very excellent drawing of the plant and fruit. The fruit produced by the plant in 1817, resembled the Hautbois in form, that of the present year has materially altered

in shape, as is evident from Mr. Hooker's drawing, as well as from his description of those berries, which he tasted and examined.

Mr. Knight states the produce of this variety to have been very abundant, in the last and preceding season: and, in addition to its other merits, it has the property of affording a long succession of crop, since it continues to furnish a supply of fruit for five or six weeks, from the time it first begins to ripen. The foliage is rather large, the footstalks of the leaves are very hairy, and the leaves themselves are somewhat so. The plant seems to possess a singular hardiness in its leaves, as they remained quite fresh and green through the whole of the two past winters.

LXXV. *Upon the Culture of the* Guernsey Lily. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read August 3d, 1819.

A wish has been expressed by the Council of the Society, that a method of cultivating the *Amaryllis Sarniensis,* or *Guernsey Lily,* should be discovered, by which the bulbs of that plant might be made to afford blossoms, regularly, through successive seasons: and I, in consequence, address the following communication upon that subject; believing, that I can satisfactorily account for its sparing production of blossoms in our climate, and point out a mode of cultivating it, by which it may be made to blossom, much more freely than it usually does, though I have not attained the object desired by the Society.

Bulbous roots increase in size, and proceed in acquiring powers to produce blossoms, only during the periods in which they have leaves, and in which such leaves are exposed to light; and these organs always operate most efficiently when they are young, and have just attained their full growth. The bulb of the Guernsey Lily, as it is usually cultivated in this country, rarely produces leaves till September, or the beginning of October, at which period, the quantity of light afforded by our climate is probably quite insufficient for a plant, which is said to be a native of the warm and bright climate of Japan; and

before the return of spring, its leaves are necessarily grown old, and nearly out of office, even when they have been safely protected from frost through the winter. It is, therefore, not extraordinary, that a bulb of this species, which has once expended itself in affording flowers, should but very slowly recover the power of blossoming again. The operation also of a cold climate, in retarding its period of vegetation, must have led the plant into late habits, like those of the Vines, described by Mr. ARKWRIGHT, in our *Transactions*;* and, consequently, instead of being naturalized, and adapted to our climate as plants become, which propagate by seeds, it is, probably, now less capable of producing a regular annual succession of blossoms, than a similar variety of the same species of plant, immediately imported from Japan, would be.

Considering, therefore, the deficiency of light and heat, owing to the late period of its vegetation, as the chief cause, why this plant so often fails to produce flowers, I inferred that nothing more would be required to make it blossom, as freely, at least, as it does in Guernsey, than such a slight degree of artificial heat, applied early in the summer, as would prove sufficient to make the bulbs vegetate a few weeks earlier than usual in the autumn.

Early in the summer of 1816, a bulb, which had blossomed in the preceding autumn, was subjected to such a degree of artificial heat, as occasioned it to vegetate six weeks, or more, earlier than it would otherwise have done. It did not, of course, produce any flowers; but in the following season, it blossomed early, and

* Page 95 of this volume.

strongly, and afforded two offsets. These were put, in the spring of 1818, into pots, containing about one-eighth of a square foot light and rich mould, and were fed with manured water, and their period of vegetation was again accelerated by artificial heat. Their leaves, consequently, grew yellow from maturity, early in the present spring, when the pots were placed in rather a shady situation, and near a north-wall, to afford me an opportunity of observing to what extent, in such a situation, the early production of the leaves in the preceding seasons had changed the habit of the plant. I entertained no doubt but that both the bulbs would afford blossoms, but I was much gratified by the appearance of the blossoms in the first week in July. Wishing to obtain seeds, I then removed the plants to a forcing-house, in which they have flowered very strongly; and the appearance of the seed vessels gives much reason to suppose, that I shall succeed in obtaining seeds, though I am not at present able to speak decisively.

From the success of the preceding experiment, I conclude that if the offsets, and probably the bulbs, of this plant which have produced flowers, be placed in a moderate hot-bed, in the end of May, to occasion the early production of their leaves, blossoms would be constantly afforded in the following season: but it will be expedient to habituate the leaves, thus produced, gradually to the open air, as soon as they are nearly full grown, and to protect them from frost till the approach of spring.

Should seedling plants be obtained, the powers of life in those, will probably prove more alert: and I think

it probable, that, with a moderate degree of care, these may be made to afford blossoms in successive seasons; though it should be found impracticable to give that habit, to the offsets of the individual seedling plant, now in cultivation.

LXXVI. *On the Cultivation of the* Underground, *and some* other Onions. *In a Letter to the Secretary. By* John Wedgwood, *Esq. F. H. S.*

Read September 21st, 1819.

My dear Sir,

I have just now read in the Horticultural Society's *Transactions,** Mr. Maher's Paper on the cultivation of the *Underground* or *Potatoe Onion.*

I am myself a grower of these Onions, but do not entirely agree with Mr. Maher, in all particulars; I will state wherein I differ from him. His method of planting is very good; but, in the subsequent treatment, I believe he is wrong.

I never use the hoe to the plant, except for clearing the ground from weeds. When the Onions have shot out their leaves to their full size, and when they begin to get a little brown at the top, I clear away all the soil from the bulb, down to the ring, from whence proceed the fibres of the roots, and thus form a basin round each bulb, which catches the rain, and serves as a receptacle for the water from the watering pot. I find that the old bulbs then immediately begin to form new ones, and if they are kept properly moist, and the soil is good, the cluster will be very large and numerous. This is not the only advantage of this mode of treatment, as the bulbs thus grown above ground are much sounder than those formed be-

* Page 305 of this volume.

neath the surface, and will keep much better; indeed I find them to keep quite as well as any other sort; but this was not the case, until I adopted the plan I have described.

Having said thus much on Underground Onions, I am tempted to give you the result of three different trials of *growing Common Onions,* which I made this year, for my own satisfaction; and as my mind has been thoroughly convinced as to the best method, it may be useful to give the particulars. I claim no merit in what I have done; but I think it is of great advantage, repeatedly to call the attention of gardeners to good methods, which have been previously made known, but have been suffered to pass by unheeded.

My first mode was with the small bulbs of Portugal Onions, sown in May 1818, and which were of the size of small nuts; the ground was trenched two spades graft deep, but no dung was put in, and the bulbs were planted on the 10th of March last, six inches apart, and the rows were at the same distance asunder: they have produced a very good crop of fine Onions.

The second mode was with Onions sown in September, 1818, and transplanted into rows, the same as in the preceding case, into the same ground, and at the same time. They did not produce bulbs so large as the first.

The third mode was sowing the seed in drills, six inches asunder, and thinning the plants to about four inches distance. These were sown in the same soil, and on the same day that the others were planted, and produced a very good crop; but not to be compared to the first, which

had also the advantage of ripening, at least a fortnight sooner.

I planted also some small bulbs, of the sowing of the early part of the spring of 1818, but they almost all went to seed, and when the flower bud was pinched off, the bulb produced two new ones.

My own conviction of the value of Mr. Knight's method* of sowing the seed in May, to form bulbs for the next year's stock, is so great, that I shall for the future adhere to it, and only sow a little seed in the spring, to supply green Onions.

The kinds of Onions I have sown, are the Portugal, the James's keeping, and the Two-bladed Onion.

I am almost ashamed of troubling you with such trifling matters, and shall merely add, that the soil of my garden is a light sand, and that I have difficulty in procuring dung in sufficient quantities, which will account for my not using any in these experiments.

I am,

my dear Sir, your's truly,

John Wedgwood.

Betley,
September 3rd, 1819.

* See Horticultural Transactions, Vol. I. page 157.

LXXVII. *On the Cultivation of the* Impatiens Balsamina, *or* Balsam. *By Mr.* John Fairweather, *Gardener to the Earl of* Orford, *at Woolterton, in Norfolk, Corresponding Member of the Horticultural Society.*

Read September 21, 1819.

The seed of the *Balsam* should not be less than three or four years old, when sown; the best double flowers which I procured this season, were raised from seed nine years old: and my experience has convinced me that new seed seldom produces double flowers. It may be sown any time from the 1st of March to the 1st of May; two or three sowings during that period will be most advantageous; but that which is intended to produce plants for seed, should not be later than the 1st of April. The sowing should be thin, in shallow pans, or wide mouthed pots, which must be placed in the hot-house, or on a hot-bed, under a frame.

When the plants are about an inch high, they are to be planted in pots, two inches asunder, and again placed in the hot-house, or hot-bed, as near the glass as possible. If placed in a frame, they must not be too much covered, nor kept very hot, for in either case they will be drawn up with weak, naked stems, and no future treatment will remedy the defect. When about five inches high, the plants must be again moved into forty-eight sized pots, one into each pot, and shaded until they have struck root, always keeping them close to the glass, to prevent their being

drawn. As soon as the roots have filled the pots, let them be moved into others of a larger size, and when they begin to flower, select the best plants, and pot them once again;* they may then be set in the green-house, after the green-house plants have been taken out.

As soon as the pots are again filled with roots, they should be placed in pans, and, in dry weather, abundance of water should be given them, but in moist cloudy weather, very little will be necessary, if water be kept in the pans; for too much moisture upon the plants, unless the air be clear, is apt to rot them.

The best compost for Balsams is chiefly composed of good rich loam, such as is generally used for growing Melons; if it has not been formerly mixed with leaf mould or dung, I mix it afresh, using one half of loam, one quarter of leaf mould, and one quarter of very rotten dung; if the loam is of a heavy nature, it requires rather more leaf mould, or a little sand to be added to the mass, to keep it from binding.

A good Balsam ought to have a strong thick stem, furnished with branches from bottom to top. I always separate those with red or dark coloured stems from the rest, and when the weather becomes warm, plant them out in the borders of the pleasure ground, or flower garden; I leave none in pots but those with clear transparent stems.

The plants from which seed should be saved, are those which have good double flowers, with clear bright colours,

* My experience justifies me in stating, that frequent potting the plants during their growth, tends particularly to improve their beauty and vigour, consequently, it is advisable to shift them oftener, if possible, than is here directed.

and finely striped, like a Carnation. I have put a few of the finest I have this season, into large pots, such as are called twelves about London; they are beautifully branched from the very bottom to the top; some of them measure fifteen feet in circumference, and four feet high above the pot.

LXXXVIII. *On the Cultivation of* Figs, *on the Back Walls of Vineries. By* Joseph Sabine, *Esq. F. R. S. &c. Secretary.*

Read December 10, 1819.

In the common method of cultivating *Grapes* under glass, it may always be observed that the Vines trained to the back wall of the house seldom yield either an abundant or well flavoured crop: this is caused by the plants being too far removed from the glass, and too much shaded by the Vines trained under the rafters. I have always considered Fig trees as better suited to the back wall in a Grape-house than Vines, and have lately seen them succeed so well in the garden of a friend in Norfolk, that I cannot better describe the plan I recommend, than by detailing the practice I there observed.

The house I allude to is forty-four feet long, by twelve feet and a half wide, in the clear; the back wall is fourteen, and the front wall rather more than four feet high; there is no upright glass in front: the Vines are planted on the outside, on a border raised against the front wall, and are brought into the house under the wall plate; the flue is in front only, returning upon itself, the chimney being over the fire place, which is at one end of the house, the door being at the other end, so that there is no dip in the flue; a paved walk goes along the house near the flue, leaving a border between the pavement and the back wall;

two Fig trees are planted against the back wall, one is a brown the other a white Fig, kinds which are common in Italy and in the south of France, and both bearing fruit of a short and flattened form. These trees have been planted fifteen years, and entirely cover the wall; the border in which they were planted, was originally made very rich, and they have grown well in it; the branches are trained to a trellis against the wall, but they are also suffered to project from the wall. The trees are pruned in the autumn, after their wood is well hardened, where it is necessary to prevent them from incumbering the house; but as the object is to get the trees to the largest possible size, in which state they will produce more of the short fruit-bearing shoots, they are cut but little, except it be occasionally necessary to thin them, by taking out a strong limb; it is the practice to begin forcing when the Grapes break in the middle of April; the first crop of Figs ripens in June, and the second crop in August; the Grapes begin to ripen in September, and continue fresh until near Christmas.

Under such treatment both kinds of fruits are of great excellence. It is advisable not to train the Vines entirely under the whole of the glass, but to leave a space in the centre of each light, its whole length, for the admission of the sun's rays: the Grapes perhaps will be as much benefitted by this practice as the Figs. The height to which the Fig trees are suffered to grow must be regulated by the consideration, whether it be desired to sacrifice part of the crop of Grapes to the increase of the produce of Figs; if the Fig trees are permitted to reach the glass, the Vines must be

shortened in consequence; but if it be desired that the Vines should bear the whole length of the rafter, it will be necessary to keep the Fig trees shortened, so as not to interfere with the Vines.

LXXIX. *Instructions for Raising Varieties of the* Iris Xiphioides, *or* English Iris. *By Mr.* William Masters, *Jun. F. H. S.*

Read July 6th, 1819.

It has always been the practice annually to import fresh roots of the varieties of the *Iris Xiphioides* from Holland, but the success I have had in their production, in my own garden, encourages me to hope, that however necessary may be the supply of some kinds of bulbs from that country, we may rely, in future, on our own efforts, for the production of these.

About seven years since, I had a single root, which was the pale blue, or gray variety; from the seeds of this, all the sorts I now possess, were produced. The primary object, in raising plants from seed, is, undoubtedly, to procure new varieties, and I know of no flower that better repays the time and attention of the Horticulturist, than this species of Iris, as it is attended with little difficulty in rearing, and appears to be a plant from which an infinity of changes may be produced.

It usually blossoms in June and July, and rarely exceeds two feet in height; it belongs to that subdivision of the Genus, which contains the bulbous-rooted sorts, without the bearded nectary. In August, the seeds become ripe, and are plentifully produced on all seedling plants, although, like many other plants, but sparingly, and very frequently not at all, on such as have been long increased by offsets, or

parting the roots; they may be sown in slight drills, about six inches asunder, as soon as ripe, and in the March following they will make an appearance very similar to rows of young Onions. With no other care, than frequent weeding, they may remain in the seed-bed for three years, for they are much more hardy than most kinds of seedling bulbs, and, therefore, will not even require protection from the frosts. In August or September of the third year, it will be necessary to transplant them into beds, at one foot distance, row from row, and the bulbs, six inches apart; and in two years from their removal, most of the strongest will shew blossom, and nearly all in the year following, or the sixth from the seed.

If, during the time the roots are at rest, the top surface of the earth is carefully removed, and fresh light loam is substituted, a year will be saved, for this treatment will greatly promote the growth of the bulbs, and with these, as well as many other seedling plants, it is not a stated time that must pass before they blossom, but only such a portion, as will allow the bulb to attain a size sufficient to contain vigour to produce and perfect a flower stem, the rudiment of which is formed in the preceding summer. When they blossom, a selection can be made, and the varieties perpetuated by the increase of their offsets. The most proper time for removing the bulbs, is in August and September, those kept out of ground until Christmas rarely blossom in the succeeding summer. They will thrive in almost any soil or situation, except where sand or chalk are within a few inches of the surface.

There are several species of Iris with bulbous roots, which

produce flowers in the summer season, of these *I. Lusitanica, I. juncea,* and *I. alata,* though described by botanical writers, are but little known to gardeners. *I. Xiphium,* and *I. Xiphioides,* we are sufficiently acquainted with. Mr. GAWLER* is of opinion that there are some species, which are yet undescribed.

Iris Xiphium and Iris Xiphioides are frequently confounded with each other; the first has smaller bulbs and smaller flowers, and though the varieties of it are many, they are not so numerous or so handsome as those of the other species. The Iris Xiphium is called Spanish Iris, because it grows wild in Spain. The Iris Xiphioides is a native of the Pyrenees, and still absurdly retains its original erroneous name of English Iris, which it received from the old Low Country gardeners, because it first came to them from England, where it had, no doubt, been imported from its original place of growth.

Note by the Secretary.

When the above Paper was read, Mr. MASTERS exhibited numerous samples of flowers of the English Iris, which he had raised from seed; and on the same day a collection of flowers of the same species, from Dutch roots, growing in the garden of the Society, was also exhibited; Mr. MASTERS' specimens were as beautiful and as various as the Dutch, except that few dark blue or purple flowers were amongst them; this is to be accounted for, by the circum-

* Botanical Magazine, No. 686.

stance mentioned by Mr. Masters, that the original stock from whence his plants were raised was the light blue variety. The darker flowers are the most splendid, though perhaps not so beautiful, as the lighter varieties, on close examination.

LXXX. *Description of the* Hollow Leek, *supposed to be the true* Welsh Onion; *with Notices respecting some other Varieties of the Genus* Allium, *grown in South Wales; and Observations on Cottage Gardens. In a Letter to the Secretary. By Mr.* Thomas Milne, *F. H. S.*

Read October 5th, 1819.

Sir,

Herewith you will receive bulbs of the Allium I mentioned, when I had last the pleasure of seeing you at this place. What it may prove to be, I will not venture to decide; but I think it is not improbable, that it may be that variety which you are desirous to obtain, I mean the Scallion mentioned by Miller, which has been supposed to be lost. I received it from Pembrokeshire, where it is known by the name of *Hollow Leek*, it has been, and now is, very generally cultivated in the cottage gardens, in the south-west part of that county. Being, as almost all the Onion tribe are, very wholesome, it is much used by the cottagers, to give a relish to their broth, and other food.

When the leaves wither, the roots, as you will observe, very much resemble Shallots. They are generally planted very thick in beds, in a convenient corner of the garden; one bulb, in a season, will increase and form a cluster from six to ten or more, as the soil or situation may suit their growth. Those persons who cultivate them, however, seldom divide or transplant them, unless they are leaving their

cottages, or in order to supply a neighbour with bulbs for a fresh plantation. The plants shew very little disposition to produce flowers; I have seldom, as far as I can recollect, seen them in that state, and they have been growing two years in my garden at Fulham, without shewing any appearance of blossom, though planted in a favourable situation.

At what time they were introduced into that part of South Wales, from whence I received them, I cannot pretend to say; but it is not improbable, that they originated with the Flemings, from whom, it is said, most of the present inhabitants of the county of Pembroke are descended.

Whether the Hollow leek is generally used in the more interior parts of Wales, I cannot inform you, but I think it is very likely it may be; I have also heard, that it is cultivated in nearly the same way, and for the same purposes, in the west parts of Devonshire and Cornwall, between which places, and the whole of South Wales, there are continual intercourse and dealings.

In the account of the varieties of the Onion, printed in the *Transactions of the Horticultural Society,** it is observed, that the appellation of Scallion used by the old gardeners, would have been applied by the writer of that Paper to the Welsh Onion (Allium fistulosum of Linneus), but that Miller makes the Scallion distinct from the Welsh Onion. The plant known in England by the name of the Welsh Onion cannot have been so called from its general use in Wales, for it is very remarkable, that during a residence of fourteen years in Pembrokeshire, and in two subsequent

* Page 379 of this volume.

journeys through the principality, on my business as a nursery and seedsman, I have seldom seen the Allium fistulosum cultivated, or received an order for seed of that sort. Is it not possible, that a confusion has taken place respecting the names of the Scallion and the Welsh Onion; that the latter ought to have been applied to the Hollow Leek, which I have now described, and that the Scallion of the old English gardeners is the Allium fistulosum of Linneus? If this conjecture should be correct, the lost Scallion of Miller will prove to be the Hollow Leek.

My acquaintance with Welsh gardening enables me to add some observations on other plants of the genus Allium, which will perhaps be interesting. The *Leek*, I need not inform you, is a favourite vegetable all over Wales, and universally managed with care; but the Welsh are of opinion that they have a sort superior to the one grown in England, and for that reason, as well as from economical motives, they very generally save their own seed. I am inclined to think, that this may be the same as the Scotch Leek, which is said, by the gardeners round Edinburgh, to be superior to the London one, because it is hardier, grows larger, and has the white part or stem longer.

To secure, as much as possible, a succession of their favourite vegetable throughout the year, the Welsh also plant the Allium Ampeloprasum, which they call Perennial Sweet Leek; they manage it, in every respect, in the same way, and for the same purposes, as they do the Hollow Leek, and I think it far superior to it, as a culinary vegetable. The bulbs of it, likewise, form a handsome pickle, and, by many, are much relished in that state. I have observed, that it is

more generally planted than the Hollow Leek. It is said to be a native of the island called the Flat Holmes, in the Severn sea.

The cottagers and others, in Pembrokeshire, also grow the *tree*, or *bulb-bearing Onion*, to much advantage, their management of it being as follows: the small bulbs, produced on the stem in the preceding year, being preserved and planted in the following spring, become Onions of a very considerable size for use, and on the stem again is produced a succession of bulbs for the next year's planting. By this means they obtain a very regular good crop, and on poor soils, they say, with more certainty than by raising other sorts from seeds. The taste of this sort of Onion is strong; but that is rather desirable, in their opinion, because the same quantity goes further for seasoning, than if it were more mild.

You will observe, that the chief part of the information contained in this communication is applicable to the small gardens of cottagers. Amongst the many benefits which the Horticultural Society may be able to render to the kingdom at large, it will not be one of the least, to point out to the poorer classes of every description, what sorts of fruits and vegetables it would be most to their advantage to cultivate. During my residence in Pembrokeshire, I witnessed the beneficial effect produced by the attention given by Lord Cawdor to this subject. He caused his labourers' gardens annually to be inspected in August, and gave small rewards to those who kept them in the most profitable state of cultivation, in proportion to the excellence of their crops. Though this practice has been some time discontinued, yet the people

having felt the benefit arising from productive gardens, still continue to pay great attention to their management, thereby living at less expense, and consequantly bringing up their families in greater comfort,

I am, with much respect,

your very obliged humble servant,

THOMAS MILNE.

Fulham, August 30*th*, 1819.

LXXXI. *Observations on the Difficulties which have existed in the Transportation of Plants from China to England, and Suggestions for obviating them. In a Letter to the Secretary. By* John Livingstone, *Esq. of Macao, in China, Corresponding Member of the Horticultural Society.*

Read November 16, 1819.

Sir,

The various objects of importance to the Horticulturist and Botanist, which are generally known to abound in China, has produced great desire to have them added to the stores of Europe; and no small degree of astonishment is frequently expressed, by those who know of their existence, at the very slow progress which has been hitherto made towards the reasonable gratification of this laudable desire. Many persons seem inclined to account for this fact by supposing that those gentlemen who enjoy opportunities of sending or bringing home Chinese plants, are either ignorant of the great estimation in which they are held, or strangely unwilling to bestow the necessary attention, on a subject so dear to the lovers of fine plants.

In this letter I propose to lay before the Horticultural Society of London, such observations as have occurred to me during the last twenty-five years, in which I have been more or less conversant with the subject. From these I think it will appear, that much has been attempted, and although, comparatively, but little has been accomplished,

that the failure is to be accounted for by, or attributed to, causes very different from those above mentioned.

If China may be considered as nearly a *Terra Incognita* to the European botanist; Botany, as a science, is equally unknown to the Chinese. Their botanical arrangements (if indeed they deserve the name) are extremely defective. No attempt has been made by them to form genera and species; the place of growth, the use, and the like, being with them the only distinguishing marks of plants. It therefore cannot be supposed, that any thing like a scientific botanical collection exists in China. With the exception of a scanty Herbal, which was compiled by order of a former emperor, and some meagre articles on plants, in their Encyclopædias, they have nothing which could have even secured a tolerable uniformity in the names, by which plants are known; so that Europeans (whose intercourse with China has been for the last half century, almost entirely confined to the port of Canton), frequently find that plants are not known by the same names, at the distance sometimes of a very few miles. This is a great impediment, and must be severely felt, by all strangers. Every new adventurer must feel himself quite insulated, for he neither can receive adequate help himself, nor impart to his assistants the necessary instructions.

The state of botany in China, may be also pretty correctly understood, by examining the *Fa-tee,* or flower gardens, situated on the banks of the river, at a short distance from Canton. To these small nursery gardens strangers used to have access at all times; but for the two or three last years, their visits have been restricted to three

days in a month, (say the eighth, eighteenth, and twenty-eighth,) and they must besides pay eight dollars for their *chop,* or permission to go thither. In these gardens may be seen all the plants, for which a demand exists among the Chinese themselves, but they will be found to consist of a very small variety, comprehending only shewy or odoriferous plants, shrubs, and trees, and such fruit trees as are commonly cultivated in their gardens. To these may be added, abundance of dwarf trees, which the Chinese greatly admire, and for some of which they are content to pay a very high price.

The soil of these gardens, and indeed of the banks of the river, to a considerable distance, consists of a strong alluvial clay. The plants are either kept in the ground, or they are placed in pots, which are invariably filled with the same kind of clay as the soil. The clay, at lesst on the surface, both of the ground, and of the pots, is broken into small cubical pieces of about half an inch in size. This soil has, no doubt, many advantages in the climate of Canton, where violent rains, and droughts of long continuance, are very common: for the small lumps of clay do not readily coalesce and run together, in consequence of the rains, or necessary waterings; but it is very obvious that plants so prepared, cannot be generally well suited for the purpose of transportation. The rich Chinese commonly contract with the proprietors of these nurseries, at a certain price by the year, for a succession of plants, when in flower or fruit, which, after being used, are returned, to make room for others, in a fresher state, or of greater beauty.

It is from these collections which I have described, that

Europeans are generally supplied with the plants, which they send, or carry home; and it surely cannot be surprising that plants so treated commonly die on the passage.

About fifteen years ago, Mr. William Kerr was sent from the Royal Gardens at Kew, for the purpose of collecting Chinese plants, to increase the splendid stores of that establishment. Infinite pains seemed to have been taken in framing his instructions. The chests and boxes formed for the reception of the plants, were contrived with the greatest judgment; and every facility was secured for the ready transmission to Kew of all the plants which he might wish to send there: yet, on a comparison of the number of plants which he sent on board the Honourable Company's ships, with those which arrived in good health at the Royal Gardens, it will be quite clear that he was not successful; upon the whole, not more fortunate than the private adventurer,

The principal error in Kerr's appointment, seems to me to have been, the want of sufficient encouragement. His salary was almost too small for his necessary wants, and he consequently lost respect and consideration in the eyes even of the Chinese assistants, whom he was obliged to employ. I have not the slightest doubt but his failure is to be attributed, chiefly, to the necessity he was under of associating with inferior persons, from his deficiency of means, to support himself more respectably. Had his emoluments been sufficiently ample, to have enabled him to be master of his time, I am persuaded, that it would have been well employed; and I am confident that he would have highly deserved encouragement. In justice, I must

add, that the reward which he expected for his labours in China, (a better appointment on the island of Ceylon), he received about six years ago, when he left China. His letters to me, from Malacca and Calcutta, were well written, and evinced so much attention to his proper pursuits, that I entertained some hopes he would be more successful in his new station; but I did not hear from him again, and I understand that he died soon after he reached Columbo.

When I have been myself so fortunate as to find friends willing to take charge of the plants, which I wished to send to England, my experiments have been unsuccessful. Sometimes the whole have arrived in good order, in the river Thames, yet I have suffered the mortification of learning, that, before the requisite formalities of office could be complied with, they had perished for want of due attention, at that late period of their voyage. At other times, I have been informed that only a few of my plants had reached St. Helena, and that having been sent on shore, they died of neglect; when their recovery from a weak or sickly state was the motive for removing them from the ship. Again, I have heard that my splendid list had arrived, but that the plants were all dead, evidently from the neglect of a due supply of water, since, from the appearance of the roots, it was clear that no cause of failure had existed in the original planting of them in the pots.

My friend Mr. Reeves has informed me, that ninety out of one hundred of the plants which he carried with him to England, three years ago, arrived in good health. He has since, however, in the supplies which he has sent to the

Horticultural Society, experienced mortifications similar to my own. Thus it is evident that plants must be placed under the care of those who not only are anxious about them, but who understand how to treat them.

This season, a private house in England, (Messrs. Barr and Brookes, of Ball's Pond, near Islington), had the spirit to send to China a person well qualified for the undertaking, for the purpose of collecting and taking home plants. The season of the year, when he arrived, was the most unfavourable for the purpose, and the time which his ship remained, was far too short to enable him to do much; yet I most sincerely hope that the experiment will prove successful, and deserve imitation.

From this rapid sketch, I think it may justly be concluded, that no insuperable difficulties lie in the way of conveying plants in safety from China to England, if they are skilfully planted, watered daily with good water whilst on ship-board, carefully attended to during the passage, and have a speedy delivery secured for them on their arrival in the Thames. To effect these different essential objects, the following particulars require attention: the plants should be collected in proper time, so as to enable them to be firmly rooted in the soil in which they are to be transported to England; a proper soil should be obtained, wherein they might be planted; they should be arranged in their chests or boxes, accordingly as they require abundant, frequent, moderate, or slight waterings; when on board, the covers of the chests should be well closed when the spray is flying over the ship, and opened at all times in temperate and fine weather; the plants should be duly watered with good water,

and particular attention be paid to them, from the time the ship arrives at her anchorage in the Thames, till they are landed.

As but few plants can be had at the nursery gardens at Canton, and even these by no means in a proper state for transportation, those who wish to send any home, with a fair chance of success, will do well to procure them at least six months before the time of the ship's sailing, in order that they may be in a proper condition for the voyage.

Being without data for a correct calculation, I must content myself with the nearest approximation I am able to make, from my own knowledge and observation: from these I am of opinion, that one thousand plants have been lost, for one, which survived the voyage to England. Plants purchased at Canton, including their chests and other necessary charges, cost six shillings and eight pence sterling each, on a fair average; consequently every plant now in England, must have been introduced at the enormous expense of upwards of £300. It surely, then, becomes a matter of importance to attempt some more certain method of gratifying the English horticulturist and botanist, with the plants of China.

I venture, therefore, to submit the following plan to the consideration of the Horticultural Society. I am pretty confident it will answer much better than any thing which has hitherto been attempted or proposed. I do not doubt but that the Honourable Court of Directors of the East India Company, with their accustomed liberal attention to every laudable scientific pursuit, would not only readily grant permission to the Horticultural Society to send out to China,

a properly qualified gardener, and place him under the immediate protection of their Select Committee of Super Cargoes; but that they would also approve of the managing owners, and Captains of their ships, making the necessary arrangements for bringing home the plants which he might be able to collect.

The gardener should reside at Macao, having a suitable establishment, a house, garden, and native assistants. After defraying all his necessary charges, it might be advisable to make his further emoluments to depend chiefly on the success of the undertaking, by paying to him a certain handsome sum for every new plant, with which he enriched the horticultural or botanical stores of England.

The arrangements to be made for the transportation of the plants should be liberal, and beneficial to the parties assisting in it. The owners should be paid the proper freight for the requisite quantity of water: and it would probably be found best for all the parties concerned, to have a person, in each vessel on board which the plants are shipped, sufficiently acquainted with the business of a gardener, to take the entire charge of the plants during the passage.

After an ample stock of all the desirable plants had been secured in England, the gardener might be recalled; but the plan, if successful, is capable of much extension; for if a person of sufficient abilities was appointed, he might extend his researches to the Phillippine Islands, Chochin-china, the Malay Peninsula and Islands, &c. &c. The garden at Macao might become the depositary of an extensive collection of the botanical riches of those places, from whence they might be transported to Europe.

Having thus explained my ideas on this important subject, I shall be most happy to see them adopted; I need scarcely add, that I shall be ready at all times, to give these or any other plans my best assistance. Much is to be done, and I am fully persuaded that a hearty co-operation of all the lovers of Horticulture and Botany, is fully equal to its accomplishment.

I remain,

SIR,

Your very obedient Servant,

JOHN LIVINGSTONE.

Macao,
February 5th, 1819.

LXXXII. *Account of Count* Zubow's Steam-Pits, *at St. Petersburgh. By* Frederick Ernest Lewis Fischer, *M.D. Inspector of the Botanic Garden at Gorinki, near Moscow, Foreign Member of the Horticultural Society.*

Read June 1st, 1819.

Public attention having been of late a good deal excited relative to Count Demetrius Zubow's *Steam House,* at St. Petersburgh, I take the liberty of presenting to the Horticultural Society, the following details respecting it. The operation has hitherto been performed on a very small scale, but with a success which will, no doubt, lead to improvements, of which I think the plan is capable.

Count Zubow's Steam House contains two pits, each nearly twenty feet long, by six feet wide; and between these a steam boiler is placed. The whole of the bottom of each pit is a reservoir, about eighteen inches deep, formed of inch and three-quarter planks, closely jointed, and caulked; this chamber is filled with water to the heighth of about ten inches, and about three inches above the surface of the water, another planking of boards, one inch and a half thick, is laid horizontally, the ends of which are well secured in the sides of the pit: these upper planks are perforated with numerous holes, disposed in quincunx, to allow the steam from the water below to ascend; on this perforated planking are laid two or three strata of faggots, to prevent any earth falling through the holes into the water beneath, and above the faggots the pit is filled with earth.

Between the two pits, in the middle of the stove, is a small square furnace, containing a copper boiler, from which a copper steam-pipe is carried to each of the reservoirs. This boiler is provided with the necessary apparatus, which, as it is common to all machinery of this kind, need not be particularly described. From each side of the top of the boiler the steam pipes branch off, furnished with valves, by which the steam may be supplied to one or both, as occasion may require: the usual practice is to keep the valve of one pipe shut, until one of the beds is heated. The pipe is bent down from the top of the boiler, and enters the reservoir beneath the hot-bed, at about an inch below the level of the water, and runs horizontally nearly to the end, diminishing in its size as it advances. The pipe from the middle to the end, is perforated with holes, to allow the steam, as it condenses, to escape into the water.

With a moderate fire, the heat of the water in the reservoir, will, in an hour and an half, be so considerable, that the earth in the pit will be as high as 30° of Reaumur, above 99° of Fahrenheit), and this heat, with but little addition, will be retained for some days. At the bottom of the reservoir, is a stop-cock, by which the water can be let off; and at the back are two openings, through which fresh water is supplied. A few holes are also left in the wall of the pit, between the level of the water, and the upper planking, through which the superfluous heat may escape into the house: these are closed, when necessary, with pieces of wood.

In Count Zubow's house, the greater part of his Pines, and other plants, are planted in the earth, without pots, and nothing can exceed their cleanness, and luxuriance of growth; neither spider nor any other insect is to be seen upon them.

I doubt, notwithstanding, whether Pines thus planted out, will fruit so well as those in pots. I consider the earth, saw-dust, or whatever other materials the pit may be filled with, as only the medium through which heat is conveyed to the pots, and that, of course, it ought to be calculated for the salubrity of the plants.

I am at this time constructing a steaming apparatus on the above plan; but, instead of a wooden reservoir, I make it of brick-work, and, instead of the upper planking, I am trying a perforated brick arch.

LXXXIII. *An Account of the* Fig *Tree, which was planted in* 1648, *and is now growing in the Garden at Christ Church, Oxford. In a Letter to the Secretary. By Mr.* William Baxter, *Curator of the Botanic Garden, Oxford, Corresponding Member of the Horticultural Society.*

Read August 17th, 1819.

Sir,

I have, agreeably to your request, made some inquiries respecting the history of the Fig tree, brought into England, by Dr. Pocock, and now known by the name of the *Pocock Fig*.

The tree, which has been supposed to be the first of the sort introduced into England, is now growing in the garden of the Regius Professor of Hebrew, at Christ Church, Oxford. The traditional account given of it is, that it was brought from Aleppo by Dr. Pocock, and planted there in 1648.

In 1806, Dr. White, late Regius Professor of Hebrew, caused an engraving on copper to be made of it, which represents the whole tree, as it then apeared. At the top of the engraving is inscribed, " Arbor Pocockiana, imagine accuratissima ære expressa." And at the bottom, " Ficus arbor, ex Syria olim regione a celeberrimo Edvardo Pocockio, circiter centum et septuaginta abhinc annis, prima quidem sui generis, in Britanniam advecta, hodieque in horto Professoris Ling. Heb. apud Oxonienses, virens et

fructuosa. Junii 12mo. A.D. 1806. Altitudo arboris 21 pedes; ambitus trunci in parte superiori, 3 pedes 6 unciæ."

The tree received considerable damage from the fire, which happened at Christ Church on the third of March 1809; till that time the large trunk mentioned by Dr. JOHN SIBTHORPE, in MARTYN's Edition of MILLER's Gardener's Dictionary, and which is represented in the engraving above mentioned, remained. Dr. WHITE, in order to preserve it from the injuries of the weather, had the top of it covered with lead, but at the time of the fire, the lead was stolen, and soon after, the trunk itself decayed and was removed.

The tree, at this time, is in a very flourishing state; it does not shew those marks of old age, which it did at the time the engraving was made of it; but there are some small remains of the old trunk to be seen a few inches above the surface of the ground. The branches now growing, I suppose to be not more than eight or ten years old, those in the centre of the tree are twenty-one feet high. There are some Figs upon it, which will be ripe enough to send to the Horticultural Society, for their next meeting.

I have the honour to be,

SIR,

your most obedient,

and very humble Servant,

WILLIAM BAXTER.

Botanic Garden, Oxford,

August 11, 1819.

Note by the Secretary.

Some Figs, the produce of the Pocock Fig tree, were exhibited at the Meeting of the Horticultural Society, on the 17th of August, and proved to be the sort usually known by the name of the *White Marseilles Fig*. The supposition, that the Pocock Fig tree was the first of the sort introduced into this country is erroneous, for there are now growing in the garden of the Episcopal Palace at Lambeth, Fig trees of the same variety as the Pocock Fig, of much greater age, and which are generally believed to have been planted there, by Cardinal Pole, in the time of Henry the Eighth.

LXXXIV. *Account and Description of the Varieties of* Spring Radish. *By Mr.* CHARLES STRACHAN, *Gardener to the Horticultural Society.*

Read July 6, 1819.

THE Garden Committee, in prosecution of their plan of ascertaining distinctly the different sorts of each vegetable in cultivation, having directed that seeds of all the kinds of Radishes should be sown in this season, in the garden of the Society, I have now the honour of stating the result of this experiment, as far as respects the *Spring Radishes.*

The Radish, *Raphanus sativus* of LINNEUS, is supposed to be a native of China, but has long been cultivated in our gardens, for the sake of its roots, which are eaten raw, before the plant, which is an annual, shoots into flower; when the roots grow large, even before they throw up the flowering stem, they become hollow, and lose their goodness; they are therefore solely used when in a young state, and the matured plant is only kept for seed, and for supplying a few of the green seed pods for pickles.

Besides the kinds which I am about to treat of, there are others, which are usually denominated autumn or winter Radishes, from coming into use in those seasons; these are very distinct from the Radishes which are cultivated for spring use, to which alone it is proposed to confine my present observations, reserving the notice of the others for a future occasion.

The Spring Radishes are of two kinds, those with spindle-shaped roots, or the *Long-rooted Radishes,* and those with

round roots, or the *Turnip Radishes:* the first sort is called by the French *Rave;* to the latter they give the appellation of *Radis.* Of each of these there are several sub-varieties, which will be now described; they have all been grown during the past spring, in the garden of the Society, having been raised from collections of seeds obtained from the various Correspondents of the Society at home, as well as from France and Holland.

The Long-rooted Radishes have received among gardeners a great variety of names, which, in strictness, are reducible to those appertaining to colour only; for the denominations of *Short-top, Frame,* and *Early,* which are given to each of the different colours, but principally to the scarlet and purple, are only designed to indicate peculiar properties which belong to the individuals from whence the seed had been obtained, and which properties I do not find to remain so permanently established as not to require being again obtained by renewed selection. The denominations of these plants seem to be applied more irregularly and indefinitely in France than they are with us; for in several cases, the different kinds of which M. Vilmorin sent seeds to the Society, did not agree in name with those enumerated in the *Bon Jardinier* of the present year, though there can be but little doubt that the same plants are intended to be designated by the different appellations.

The character of a good Long-rooted Radish, is to have its roots straight, long, free from fibres, not tapering too suddenly, and especially to be fully formed on the top, or well shouldered as it is called, and without a length of neck; the roots should be ready to draw whilst the leaves are small, which is

what I conceive to be meant by a *Short-top Radish,* and if they soon attain a proper size, as well as force well, they are then called *Early,* and *Frame Radishes.*

The *Long White Radish,* which is sometimes called the White Transparent, as well as the White Italian, and in latter years the Naples Radish, appears to be the oldest inhabitant of our gardens; for it is the only true spring Radish with a long root mentioned by GERARD; so that, without doubt, the other kinds are of later origin. GERARD calls* it *Radicula sativa minor* or Small Garden Radish, and says, "the root is small, long, white both within and without, except a little that shews itself above the ground, of a reddish colour." It came in the collection of seeds from Holland, but was not amongst those sent to the Society from Paris, by M. VILMORIN: it is mentioned in the *Bon Jardinier* as *la Rave blanche.* It is a week later in becoming fit for use than those sorts most commonly grown; it is very mild, and has a delicate pleasant flavour, certainly equal to the others, and is deserving cultivation on account of the difference of its colour. It grows but little above ground, and when exposed, is slightly tinged with green, and sometimes with faint purple; the portion below the surface is of a pure white; the flesh is transparent when young, but becomes more opaque as the root enlarges; the leaves are generally strong and large.

The *White Russian Radish,* of which a short account is given in the Society's *Transactions,*† differs from the Long White Radish in several points: it is not fit for use until

* GERARD's Herball by JOHNSON, page 237, 238.

† Page 115 of the present volume.

a week at least after the other; its flesh is not so transparent, and it is hotter to the taste; the root has a thicker outside coat, and it tapers more suddenly. This grows to a considerable bulk, and remains good when large, on which account I should have been disposed to class it with the autumn Radishes, had not its root been good and useful when small, like that of the other spring Radishes. I suppose it to be the same as GERARD'S *Raphanus sativus*, or Garden Radish, of which he says* " the root is grosse, long, and white both within and without, and of a sharp taste." It cannot be considered as a winter Radish, since it perishes with frost. It is good to eat when large, even when it is two or three inches in diameter. Its leaves are larger and stronger than those of the common Radishes, having the footstalk green, and free from other colour. All these characters seem to remove it strictly from the class of spindle-shaped Radishes, though it might be considered an omission, were it not noticed in this account.

The French cultivate another white long-rooted Radish, which they call *Rave tortillée du Mans*. The seed of this was sent by M. VILMORIN, and the variety is mentioned in the *Bon Jardinier*. The root grows long, and does not taper much, but continues throughout of the same length; a considerable part of it grows above the ground, from whence it does not rise straight, but is bent or twisted; the exposed part of the root is slightly tinged with green; the flesh is white and firm, without heat, and insipid; the leaves are not so long or strong as those of the White Russian Radish, and their footstalks are tinged with purple. The root is

* GERARD'S Herball, by JOHNSON, page 237.

slow in coming to perfection, and may be considered a pleasant variety for use in the latter part of the year. It is not destroyed by frost.

The *Scarlet Radish,* or as it is most usually called, (from its brilliant pink colour) the *Salmon Radish,* is the *Rave Rose* of M. Vilmorin, and came from Holland with the name of the Scarlet Transparent Radish, by which it is also often designated in this country. It is the kind cultivated not only most frequently, but almost exclusively, within the last twenty-five years; especially for the supply of the London market, where the purchasers deciding on the merits of their vegetables as much, if not more, by the eye as by the taste, are attracted by its beauty. The roots, when young, are full an inch above the ground, and if of a good sort, the colour continues, without diminution of its intensity, to the extremity of the root, which grows to a considerable length.* The flesh is transparent and colourless, the exterior hue not extending beyond the coat of the root. The variations of size and precocity have given to sub-varieties of this kind, the names of the Short-top Scarlet, and the Early Frame Scarlet Radishes. And I apprehend that the *Rave de corail,* the *Rave petite hâtive,* and the *Rave couleur de Rose, ou La Rave saummonée* of the *Bon Jardinier,* are all referable to the Scarlet Radish.

The *Purple Radish,* though formerly much used, has been of late almost driven out of the gardens, by the universal preference given to the Scarlet Radish. It is the long Red Transparent Radish of the Dutch, and came to us from M.

* The best variety of the Scarlet Radish which has been known, is said to have been raised by selection by Mr. Daniel Carter, of Battersea.

VILMORIN, as the *Rave longue rouge.* Formerly, it possessed exclusively, the name of Short-top Radish; the other coloured kind being then called the Salmon Radish. The leaves are large and dark, and grow rather upright; the seed leaves are also large, which has caused it to be used exclusively for small salading. It is a very early sort, equally as good in flavour as the Scarlet Radish, perhaps preferable for forcing, and assuredly is not deserving the neglect it at present suffers. The root grows high out of the earth, and is externally of a deep purple colour, which becomes lighter towards the extremity; the flesh is white.

Amongst the French kinds of long-rooted Radishes, was a variety, more remarkable for its singularity than peculiar excellence. It was sent to the Society by M. VILMORIN under the name of *Rave blanche à collet rouge.* The upper part of the root was dark purple, and the lower part white. It was a good flavoured Radish, but had large leaves, and was defective in the formation of its neck, which was long and thin.

Although many packets of seeds with different names, were sown in the Garden, yet it was found that all the Long-rooted Radishes were reducible to one or other of the kinds above described. MILLER, in the eighth edition of his *Dictionary,* besides the Small-topped (which I suppose to be the Purple,) and the Pale Red or Salmon coloured, mentions a deep Red Long Radish, and a Long Striped Radish, both probably varieties of the Salmon; the first with a more intense colour than usual, and the second an accidental sport of nature.

Of the *Turnip Radishes,* the *White* is the first to be de-

scribed; this alone was known to the older gardeners, it being the only one of the class noticed by GERARD,* who calls it *Raphanus orbiculatus,* or Round Radish, and describes it as superior to the common White Radish, from being more wholesome, and more agreeable to the taste. It is the *Radis Blanc rond, ou Blanc ordinaire,* of the French. The leaves are small and short, compared with those of the long-rooted Radishes; and it is some days later than the forward ones of that class, in attaining a size fit for use, although it requires to be eaten when small; for when it grows large it becomes hollow. The fleshy part of the root, when the sort is true, and good, is globular, with a small fibrous end, exactly like a perfectly good turnip; but it is very apt to degenerate, by becoming long and thicker in that part which should be entirely fibrous. The flesh within the coat of the root is a transparent white, and is very mild and sweet.

The *Early White Turnip Radish* of the Dutch, which also came from France, with the name of *Radis Blanc hâtif d'Holland,* is very superior to the one above described; it is smaller in every part, both in its roots and tops, particularly in the latter, and it is decidedly earlier: it also differs in its flesh, which is a clear white, and less transparent. This, from its superior merit, ought to be introduced into regular use in our gardens.

M. VILMORIN also sent another kind, which he called the *Radis Blanc petit hâtif,* recommending it to our attention. If it can be kept as a distinct sort, it will merit cultivation; it is earlier than the common kind, its leaves are much larger, and the root, which has a slight tinge of purple on its

* GERARD's Herball, by JOHNSON, page 238.

top, has not the round shape peculiar to the White Turnip Radish, but is turbinated, or pear-shaped, having the appearance of degeneracy.

MILLER, in the eighth edition of his *Dictionary,* calls the Turnip Radish, the *Raphanus rotundus,* Round-rooted Radish, or Small Round-rooted Naples Radish. He says that it was not very common in England at that time (1768), but that it was the only sort cultivated in many parts of Italy. Though he described only one kind, he speaks of other Round-rooted Radishes, which were seldom cultivated in England: what these were, cannot be ascertained; they might have been supposed to be the Winter Radishes, had he not noticed those sorts afterwards. I apprehend the coloured turnip Radishes have originated since his time; it is, therefore, probable that he alluded only to sub-varieties of the White Turnip Radish. I believe MILLER is correct, in calling the White Turnip Radish the Naples Radish, though that name appears now to be transferred to the Long White Radish.

The *Pink, Rose-coloured, Scarlet,* and *Crimson Turnip Radishes,* are all one sort, which originated in France, (where it is called the *Radis Rouge ou Rose rond*) some years since; it was introduced into this country about 1802, and is now very common with us, especially in the market gardens of the metropolis. It comes in at the same time as the White Turnip Radish; its leaves are large, and spread wide; the root, externally, is a fine deep scarlet, and internally white, though I have seen the flesh, which is mild and good, occasionally a little stained with pink, and the sort which M. VILMORIN calls the *Radis Rose rond hâtif* is quite rose-coloured

within side. The root is usually in the form of a Pear, but sometimes degenerates into a greater length, and approaches to the appearance of a Long-rooted Radish; but it probably would be more esteemed if it could be grown in the shape of the white Turnip Radish, which was the case with those sent as the ***Early Scarlet Turnip Radish,*** amongst the collection received from Mr. Lee of Hammersmith.

The ***Purple Turnip Radish,*** the ***Radis Violet rond*** of the French, in shape, flavour, and character, closely resembles the Scarlet Turnip Radish; the leaves are pale, and of a moderate size; the external colour of the root is a fine purple, the flesh is sometimes white, sometimes a little rayed, or stained with purple. The Dutch call it the ***Red Turnip Radish.*** The seeds which came from Holland with the name of Early Red Turnip Radish, and from France, as the ***Radis Violet Rond hâtif,*** were much superior to the other foreign varieties of this sort. It seems to be but little used in the English gardens, for it did not form a part of any of the collections obtained from the seedsmen of the metropolis: the only British sample which was grown, was raised from seeds sent to the Society by Mr. Backhouse, of York, and these were remarkably fine, and beautifully coloured. I know not why it has been thus neglected, for it is equally good and handsome as the scarlet kind.

In the *Bon Jardinier,* the ***Radis petit Saummoné ou Violet,*** is mentioned: I should almost suspect that two sorts were included under those names, for *saummoné* is applicable to the scarlet, and *violet* to the Purple Radish.

Mr. Niell, the Secretary of the Caledonian Horticultural Society, in his admirable account of British Horticulture,

printed in the Edinburgh Encyclopedia, mentions the *Queen Radishes*, both red and white, as round-rooted Radishes; but I have not been able to ascertain to which of the varieties I have described, these names are applicable.

Amongst the new seeds imported last year by the Society from France, was a Turnip Radish, called the *Radis Jaune;* it is now found in our seed-shops, under the name of the *Yellow Turnip Radish.* It would probably be more properly placed amongst the Radishes cultivated in the later seasons of the year; but as it forms a good root, and is fit for use only about a week later than the kinds above described, it may also be included among the Spring Turnip Radishes. Its leaves are large and pale; the root is ovate rather than round, inclining to pear-shaped; the colour is a very pale brown, with a dusky yellowish cast or tinge, and an appearance of roughness on the coat. The flesh is white, firm, and very good, though not mild, but it is preferred by several persons, to the older sort. It is a new kind even in France, being described for the first time in the *Bon Jardinier* for the year 1815.

The above are all the sorts of Spring Radishes which have come under my notice, and I believe they are all the sorts which are grown in our gardens. It must be observed, that though I have designated them as Spring Radishes, it is not thereby intended to imply that they are unfit for summer or autumn use; on the contrary, they are, and should be regularly sown, in well cropped gardens, at all seasons. Those kinds which I have classed as Autumn or Winter Radishes, must remain distinct as such, because as they require a greater length of time to form the roots; they cannot be considered as early, and consequently not as spring vegetables.

The seeds of the different kinds of Radish are readily distinguished by the skilful seedsman. The long white Radish seed is small, flat, and pale. The Scarlet and the Purple Long-rooted Radish seeds are large, the former very light coloured, in comparison with the latter, so much so, that they can be known immediately from each other. The White Turnip Radish seed is small, round, and brown; that of the Scarlet Turnip Radish is rather larger than the White, and something darker; that of the Purple Turnip is also larger, and of a brown colour, being very similar to the Long-rooted Purple kind, except in size.

LXXXV. *On the Culture of the* Amaryllis Sarniensis, *commonly called the* Guernsey Lily. *In a Letter to the Secretary. By the Rev.* William Williamson, *A. M. Corresponding Member of the Horticultural Society.*

Read October 5, 1819.

Sir,

In the list of Desiderata, published by the Council of the Horticultural Society, in May last, I observe, that a Paper is required on a method of cultivating the *Guernsey Lily*, so as to make it produce its blossom in successive years, after it has been planted in the garden. The experiment which I am about to detail was in progress before the publication of that list, and was made in order to ascertain how soon the roots might again be brought into a flowering state after they have flowered the first time in this country; but as they came to maturity in a much shorter period than I expected, and as it seems to point out, at the same time, a method of effecting the object of the Society, I hope the following remarks will not be unacceptable to it.

Having cultivated this bulb for some years and given it the most attentive consideration, I am inclined to think, that it is impossible to naturalize it so completely to this climate, as wholly to supersede the use of artificial covering, except in some highly favoured spots; for in the island of Guernsey, where the weather during the winter is much milder than with us, the beds are usually covered with sand, and even then, so many of the bulbs are lost in severe winters, that a scarcity of them is the consequence; and fre-

quently a slight frost at the commencement of the winter, injures them so much that few of them shew their blossoms in the succeeding autumn; and at all times, under the most favourable circumstances, not above one-fourth of the bulbs flower in the same season.

These observations sufficiently prove, that the *Amaryllis Sarniensis* cannot be a native of Guernsey; for I consider that every plant in its native clime, is produced in the greatest perfection, and requires no covering whatever. Tradition informs us, that some roots of it were accidentally thrown upon the shores of that island, from a vessel which was wrecked; that they grew and flourished upon the sands, and have continued the pride and ornament of the island. Both Thunberg and Kæmpfer assert that it grows wild in the island of Japan; but they also assure us, that the winters in Japan are frequently excessively severe, especially during the prevalence of north or north-easterly winds. This bulb, therefore, unless it obtains sufficient strength to resist them by the peculiar climate of Japan, is as liable to perish by the frosts there, as by the severity of the winter in England or Guernsey; I therefore think it extremely probable, that it is not a native of Japan, but that in the interchange of productions, the Japanese procured it either from Cochin China, or from some of the islands of the eastern Archipelago.

It is, however, of little real consequence to us, to know of what place it is a native; its tenderness is sufficiently acknowledged, it must consequently be the production of a warmer climate than our own, and we can have little expectation of successfully cultivating it, without protection in winter.

Our only consideration therefore is, how to preserve it, so as to make it blossom the oftenest, and at the least expense.

In all bulbs, the leaves are the great organ, by which the roots are brought to maturity, and the bloom is the consequence of that maturity;* the leaves, therefore, must *precede,* not *succeed* the bloom. In autumnal bulbs, to an inattentive observer, the very reverse seems the fact; but we ought to consider that if the bloom be produced by the agency of the leaves, that which appears in one autumn, must be the consequence of the leaves which sprung up after the decay of the bloom in the preceding year. The beginning therefore of their year is when the leaves first spring forth, after the decay of the flower, and their use and end is to perfect the blossom for the succeeding autumn.

In its native clime, it is highly probable, the vegetation of the Guernsey Lily goes on during the whole of the winter, so that the bloom is sufficiently matured by the following autumn, and therefore appears every successive year; but in the comparatively cold winters of England and Guernsey, the vegetation of the plant is not carried on with sufficient rapidity, to effect the perfect maturation of the bloom, but requires several years to complete that, which in its native place of growth is done in one year.

It struck me, that possibly by giving the bulb the advantage of the protection of glass during our winter, it might again be brought to blossom at a much earlier period than is commonly imagined. In order to try this experiment, a

* This points out the impolicy of cutting off the leaves of bulbs after the decay of the blossom, which is generally done in the Crocus tribe, on account of their unsightly appearance.

friend of mine, late in the autumn of 1817, furnished me with some roots which had been imported that year; their bloom was then decaying. They were taken out of the pots, and, of course, received a considerable check in the removal. I immediately potted them, and placed them, during the winter, under the glass of a pit in which I had sown Melons on tan in the summer preceding, and in which the heat of the tan was very nearly, if not entirely exhausted; the leaves grew luxuriantly, and when they decayed, I took up the bulbs, and, in the autumn of 1818, repotted them in fresh earth, and placed them under the frame, as before; they were again potted in August last, and I soon had the satisfaction of seeing five out of seven shew their blossom in as great perfection as fresh imported roots.

By this it fully appears, that the old roots are by no means useless, as many suppose; for, by good management, they may again be brought into a flowering state. It appears also that, by the protection of glass, almost without the aid of artificial heat,* two winters were sufficient for this purpose, even though the plants had been checked by removal; and reasoning from this fact, I think we may fairly conclude, that by the additional aid of regular artificial heat, one winter would effect the perfect maturation, and consequently the successive flowering of the plant.

The soil which I have found to be most congenial to the Guernsey Lily is a very rich one, made light, if not naturally so, by the addition of sand; care must be taken not to give

* This is within the reach of every cottager, who may easily renovate his old roots by placing the pots in a window, so as to have the advantage of the sun.

the bulbs too much moisture, till they have taken root, as they are very liable to rot.

Thus then every effect may be produced in our gardens, by having a succession of flowering roots, and I would advise that the roots be potted, when they are advanced to a flowering state; and after their bloom is passed, that the pots be placed under a frame for protection during the winter.

I am,

SIR,

your obedient humble servant,

WILLIAM WILLIAMSON.

Westbere, near Canterbury,
September 28, 1819.

LXXXVI. *Descriptions of some of the best Varieties of* Irish Apples. *In a Letter to the Secretary. By Mr.* JOHN ROBERTSON, *F. H. S.*

Read November 16th, 1819.

DEAR SIR,

I HAVE done myself the pleasure of forwarding to you a box, containing a few specimens of the best *Irish Apples* now in season. The earlier sorts being gone by, I will embrace the opportunity another year of sending you specimens of them also.

As it is always interesting to know what the habit of a fruit tree is, as well as the character of its fruit, I herewith send you a description of a few varieties, which I drew up some time ago, and on the accuracy of which, as well as on the correctness of the names, you may rely.

I remain, dear SIR,
Your very obedient Servant,
JOHN ROBERTSON.

Kilkenny, Nov. 4, 1819.

Eve Apple. Fruit middle-sized, oval, about two inches and a half from the stalk to the eye, and two inches and a half in its greatest transverse diameter, smaller at the head than at the stalk; eye broad and shallow; stalk short; colour bright red striped with darker red to the sun, yellowish from it, a little russetted at the stalk. Ripe early in Au-

gust; of a pleasing acidulous flavour. Tree broom-headed; young shoots strong, erect, of a clear dark brown colour, thinly speckled with white; leaves ovate, acuminate, coarsely rugose above, pubescent beneath, deeply serrated; footstalks about one inch long. A good bearer, but apt to canker on light soils.

Early Crofton. Fruit large, flattish, about three inches in its transverse diameter, and two inches and a half from the eye to the stalk; sides angular: eye large; stalk short; skin reddish to the sun, yellowish from it, speckled with green; flesh soft, sweet, and juicy. Ripe middle of August. Tree flat-headed; shoots long, slender, and pendulous, generally terminated by a blossom bud; leaves ovate, acuminate, coarsely serrated; footstalk about one inch long. An abundant bearer, and healthy on all soils.

Scarlet Crofton. Fruit middle-sized, flattish, about two inches and a half in its transverse diameter, and two inches from the eye to the stalk; eye wide but shallow, sides somewhat angular; stalk short, sometimes elbowed; colour bright red, intermixed with russet to the sun, yellowish and russet from it; flesh firm, crisp, and juicy, never becoming mealy, with a rich sugary flavour. In eating from October to January. Tree flat-headed; shoots long, slender and pendulous, of a grey colour, much speckled; leaves sub-rotund, acuminate, coarsely serrated; footstalks about one inch long. A healthy tree on all soils, but bears best on a strong one, producing its fruit at the extremities.

Kerry Pippin. Fruit oval, middle sized, about two inches and a half long from the eye to the stalk, and two inches across, lengthened at the stalk, where it is elbowed;

eye broad and shallow; colour, bright yellow speckled with dots and lightly tinged with red to the sun; flesh yellow, firm, crisp, and well flavoured. In eating from the middle of September to the end of October. Tree broom-headed; young shoots erect, of a greenish brown, full of spurs, downy at the extremities; leaves ovate, acuminate, finely serrated. A healthy and good bearer.

White Russet. Fruit large, about two inches and three quarters from the eye to the stalk, and three inches in its transverse diameter near the stalk; sides angular; colour a yellowish green, intermixed with white, marked with light red to the sun, and russetted from it; stalk short, eye wrinkled; richly flavoured, but apt to grow mealy when too ripe. In use during October and November. Tree round-headed; shoots erect, strong and thin, of a light russet colour; leaves acutely ovate, pale green; footstalks about an inch and half long. Healthy on strong soils, but rather a thin bearer.

Sam Young. Fruit small, flattish, about an inch and half from the eye to the stalk, and two inches in its transverse diameter; eye remarkably large, having some of the calyx attached to it; colour yellowish clouded with russet, reddish to the sun; very apt to crack; flesh yellowish, firm, crisp, sweet and well flavoured. In use from the beginning of November to January. Tree flat headed, shoots declining, of a light brown colour; leaves sub-rotund, acuminate, coarsely serrated, upper surface shining, under slightly pubescent. An abundant bearer, and healthy on all soils.

Ross Nonpareil. Fruit middle sized, two inches and a half from the eye to the stalk, and about two inches and a half

in its transverse diameter, one side generally longer than the other; colour russet, striped with red towards the sun; stalk strong and deeply inserted; eye shallow; flesh firm, of a sweetish perfumed flavour, apt to become mealy when too ripe. In use from the end of November to the end of March. Tree round-headed, shoots of a greenish brown colour; leaves sub-rotund, acuminate, slightly serrated, foot stalks about one inch long. A great bearer, and healthy on all soils.

LXXXVII. *Account and Description of a New Seedling* Apple, *called* the Martin Nonpareil. *In a Letter to the Secretary. By* John Williams, *Esq. Corresponding Member of the Horticultural Society.*

Read December 7th, 1819.

Dear Sir,

By the Worcester mail of to-day I send you a box, containing specimens of a *Seedling Apple* for the Horticultural Society.

The tree from which the Apples were taken, was obtained from a nursery, as an ungrafted stock, about twenty-five years ago, by the Rev. George Williams of Martin Hussingtree, near Worcester, and planted in his orchard, where it has borne large crops of fruit for some years past: the excellence of this Apple induced me to ask Mr. Williams for some specimens, to be sent to the Horticultural Society; they were sent to me one day too late for your first November meeting.

I consider the *Martin Nonpareil* to be an Apple of very superior merit, as a dessert fruit, and if preserved from the effects of frost and exposure to air, it will keep perfectly sound, and afford a supply for the table from December till Midsummer. Mr. Williams gave me six of these Apples in *October last*, in a perfectly sound state, plump, and by no means withered, which were gathered in October 1818; three of these Apples I have sent you; they are now, however

withered and in a state of decay. This Apple will probably become a general favourite with the public, and will be found to yield great profit to the cottager and market gardener, for sale in the spring months, when good Apples sell at a high price.

The specimens I send you of this year were not excluded from the air, and in course do not look so fresh as when they came to me, a month ago; and they are slightly bruised, which may perhaps prevent their keeping so long as usual. I shall be happy to communicate the opinion of the Horticultural Society, on this Apple, to Mr. WILLIAMS.

I remain, dear SIR,

yours truly,

JOHN WILLIAMS.

Pitmaston, near Worcester,
Dec. 4, 1819.

Note by the Secretary.

The *Martin Nonpareil* appears fully to deserve the character given of it by Mr. WILLIAMS. The following is a description of the fruit, drawn up by Mr. HOOKER. "It is small, globular, or rather cordate, tapering very little towards the eye, and flattened at both extremities; the eye is small, closely folded, inserted on the apex, and surrounded by a few slightly projecting wrinkles; the skin is of a rather light and dullish green, heightened by tawny yellow on the sunny side, and on the whole surface is mixed a considerable

portion of russet brown; in some specimens a tinge of red is also seen mixed with yellow; the stalk is short, and not deeply inserted; the flesh is yellowish, compact, and firm though not hard, of excellent flavour, sweet, with a fine acid; the core is very small." In its general appearance it approaches the character of a Nonpareil, except that it has somewhat more of a yellow hue.

LXXXVIII. *Upon the Effects of very* high Temperature *on some Species of Plants. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read December 7th, 1819.

Having constructed a forcing-house for the purpose of attempting the culture of the Mango, and a few other species of tropical fruits, I have endeavoured to ascertain, with accuracy, the advantages and disadvantages, of employing very high temperature during the day in bright weather, and of comparatively low temperature, during the night, and in cloudy weather; and I communicate the following account of my experiments, considering the results to have been generally very favourable, and where unsuccessful, not wholly uninteresting.

A fire of sufficient power, only, to preserve in the house a temperature of about 70°, during summer, was employed, but no air was ever given, nor its escape facilitated, till the thermometer, perfectly shaded, indicated a temperature of 95°; and then only two of the upper lights, one at each end, were let down about four inches. The heat of the house was consequently sometimes raised to 110°, during the middle of warm and bright days, and it generally varied, in such days, from 90° to 105°, declining during the evening to about 80°, and to 70° in the night.

Late in the evening of every bright and hot day, the plants were copiously sprinkled with water, nearly of the tempera-

ture of the external air; and the following were the effects produced upon the different species.

The Melon. Plants of this species were trained upon a trellis near the glass, which was of the best quality, and these exhibited a greater degree of health and luxuriance, than I had ever before seen; but not a single flower ever unfolded; a great profusion of minute blossoms, nevertheless, appeared in succession at the points of the shoots, all of which perished abortively. I was much disappointed at the result of this experiment; from which I confidently expected to obtain fruit of the greatest excellence.

The Water Melon. A plant of this species, treated in the same manner as the Melon plants above mentioned, grew with equal health and luxuriance, and afforded a most abundant blossom; but all its flowers were male. This result did not, in any degree, surprise me; for I had many years previously succeeded, by long continued very low temperature, in making Cucumber plants produce female flowers only; and I entertain but little doubt, that the same fruit-stalks might be made, in this and the preceding species, to support either male or female flowers, in obedience to external causes,

The Guernsey Lily. I transferred plants of this species, from the open air to the hot-house, in the summer, with the hope of obtaining seeds, in which I was wholly disappointed. The flowers expanded very beautifully; but their pollen never shedded. The plants have, nevertheless, subsequently grown with more than ordinary vigour; and I entertain scarcely any doubt that the same roots which afforded flowers in the present season, will blossom strongly in the next.

It appears therefore from this, and the two preceding experiments, that the same degree of temperature, which may promote the growth, and exuberant health of the plant, may, at the same time, render it wholly unproductive of fruit or offspring.

The Fig Tree. Several varieties of this species were subjected to experiment; but the trees, although planted in pots, grew with so much luxuriance, and afforded me so little prospect of fruit, that I removed all except those of the large white variety, from the house. The White Fig tree succeeded perfectly, first ripening its spring-figs, (those which usually ripen in the open air in this country,) and afterwards its summer figs. The trees then produced new leaves and branches: and the fruit, which would have appeared in the next spring, ripened in high perfection in September. Subsequently also a few of those, which, in the ordinary course of the growth of the tree, would have appeared as the summer crop of next year, have ripened, and these, though far inferior to those of the preceding crops, have not been without merit.

The Nectarine. A seed of this species of fruit was planted in a hot-bed, in January last, and it vegetated in the succeeding month. It was subsequently removed to the hot-house, in which it continued to grow through the summer, without being in the smallest degree drawn by the high temperature in which it was placed: its wood, on the contrary, is remarkably short-jointed, and is covered with blossom-buds; from which I think it will be practicable to obtain ripe fruit, within sixteen months of the period, at which the plant first sprang from the ground.

The Orange and Lemon. A very high temperature appeared peculiarly favourable to plants of these species, or, I believe, more properly of this species; for I consider both, with the Citron and Shaddock, to be varieties only of the Lime. A plant which sprang from seed in March, had, in the end of August, attained the height of more than four feet, with proportionate strength; when wanting the place it occupied for another purpose, it was removed from the house. I obtained in April a plant of the China Orange, with one very small fruit upon it, which has ripened in much apparent perfection, and the tree exhibits every appearance of the most exuberant health.

The Mango. (*Mangifera Indica.*) This species of fruit tree appears to possess great peculiarity of constitution; for, although a native of a very hot and bright climate, and capable of bearing, with apparent benefit, the hot drying winds of Bengal, it vegetates freely, and retains its health in comparatively low temperature, and under a cloudy atmosphere. The plants I possess, sprang from seeds in October 1818; and their leaves acquired during winter, their proper dark green colour, and remained in perfect health till spring, although not possessing, at that period, a hot-house, I was very ill prepared to preserve them. In March they began to shoot a second time, without having been, I believe, at any period subjected to a higher temperature than 60°, and some of them are now shooting strongly; although the temperature of my house during the last five weeks, except once or twice in very bright days, has rarely been so high as 60°. The mode of growth of this plant appears also to be very singular; it extends a few inches, and then closes its terminal buds, as if its

growth for the season were ended. One of my plants has done so nine times within the last thirteen months, without having acquired a greater height than two feet seven inches. I am much inclined to believe that the Mango might be raised in great abundance and considerable perfection in the stove in this country, for it is a fruit which acquires maturity within a short period. It blossoms, in Bengal, in January, and ripens in the end of May; and Mr. Turner, in his journey to Tibet, states that he found the Mango growing in latitude 27° 50′ in Boutan, in the same orchard with the Apple tree; the Apples ripening in July, and the Mangos in September. And another Eastern traveller of credit (I think it is Mr. Barrow,) mentions an instance in which a frost, sufficiently severe to have injured the crops of barley, had proved fatal to the blossoms (only) of the Mango trees.

The Alligator, or Avocado Pear. (Laurus Persea.) The plants of this speces have grown with rather troublesome luxuriance in my house, though they have been generally confined to small pots; one plant, to which a larger pot was given, is more than six feet high, with branches extending five feet wide, and a stem, the growth of a single year, exceeding, at its base, an inch in diameter. To obtain fruit of this species within the narrow limits of a forcing-house, it would be necessary to propagate from buds, or grafts, taken from the extreme branches of trees of considerable age.

The Mammee Tree. (Mammea Americana.) Very contrary to my expectations, this plant, a native of Jamaica, proved extremely impatient of heat and light, and its

young leaves always required to be shaded, when the temperature of the house exceeded 90°. But with proper attention to screen the leaves from the mid-day sun, till they acquired maturity, the young trees of this species have succeeded as well as those of any of the preceding species.

Several other plants, part of them natives of temperate climates, grew in my house, through the whole summer, without any one of them being drawn, or any way injured, by the very high temperature to which they were occasionally subjected; and from these, and other facts, which have come within my observation, I think myself justified in inferring, that in almost all cases, in which the object of the cultivator is to promote the rapid and vigorous growth of his plants, very high temperatures, provided it be accompanied by bright sunshine, may be employed with great advantage; but it is necessary that the glass of his house should be of good quality, and that his plants be placed near it, and be abundantly supplied with food and water. In the preceding experiments, water was made the vehicle of food to the roots of the plants, in the manner I have described in a former communication,* and with similar good effects.

My house contains a few Pine-apple plants; in the treatment of which I have deviated somewhat widely from the common practice; and, I think, with the best effects; for their growth has been exceedingly rapid, and a great many gardeners, who have come to see them, have unanimously pronounced them more perfect than any which they had previously seen. But many of the gardeners think that my

* Horticultural Transactions, Vol. II. page 127.

mode of management will not succeed in winter, and that my plants will become unhealthy, if they do not perish, in that season; and as some of them have had much experience, and I very little, I wish at present to decline saying more relative to the culture of that plant.

APPENDIX.

I. *Account of the different Varieties of the genus* Citrus, *which are cultivated in Italy, according to* Dr. Sickler's *statement. By* George Henry Noehden, *LL.D. F.L.S. &c. Vice Secretary.*

Read March 3, 1818.

The Horticultural Society was, in the course of last year, so fortunate as to obtain a set of coloured drawings, representing the most remarkable sorts of *Citrons, Lemons,* and *Oranges,* which are, at present, cultivated in Italy. They were by the hand of Dr. Sickler, son to the celebrated pomologist, John Volkmar Sickler. Dr. Sickler had, during a residence of six years in Italy, paid particular attention to those fruits, and made the drawings alluded to; which, while he was in England, last summer, he was induced to transfer to the Horticultural Society of London, chiefly from a wish, to have them deposited in a place, where they would be taken care of, and might probably be converted to some useful purpose. They are a valuable acquisition, and furnish the collection of the Society with what could not easily have been procured, in any other manner. They bear the stamp of accuracy, and fidelity to their originals; and in this respect, do great credit to the author.—Upon the subject of these drawings, Dr. Sickler published, in the year 1815, at Weimar, a

German treatise,* in which the fruits in question are enumerated and described, and much interesting information, concerning them, communicated. The substance of these particulars will not be found unworthy of attention, and I will briefly lay it before the Society. It may perhaps appear new; it is, at least, very far from being generally known, and even to those, who are best acquainted with the matter, it may not altogether be indifferent.

Dr. Sickler does not profess to be a botanist; and his statements, accordingly, rather have a popular than scientifick form. This, however, does not give them less value: for they are, notwithstanding, founded upon accurate observation, and detailed with much diligence. He does not distinguish the genus *Citrus* according to its species, and these again according to their respective varieties, as a botanist would do; but arranges the whole under certain heads and divisions, to which he assigns the different fruits, conformably to some obvious characteristicks. Of the *Citrus*, collectively, he specifies no less than 74 sorts, though he acknowledges, that he has not mentioned all that may be recounted, but only those which are most known and esteemed.

The Italians of the present day, comprehend all those fruits under the name of Agrumi. This term (which is not explained by Dr. Sickler), signifies *acid fruits*, being derived from the Italian adjective *agro*, which means *acid* or *acrid*. *Agrumi*, therefore, in the widest sense, denotes all vegetable productions, which have an *acid*, or *acrid*, taste; under which denomination will come not merely *acid fruits*, but *acid*, or *acrid vegetables*, of any description, such as leeks, onions, and bitter, or sour, herbs.

* The title is: *Der vollkommene Orangerie-Gärtner, oder Vollständige Beschreibung der Limonen, Citronen und Pomeranzen, oder der* Agrumi *in Italien, und ihrer Cultur. Von D. Sickler. Weimar,* 1815. 4*to*. That is, "The complete Orange-Gardener, or a complete Description of the Lemons, Citrons, and Oranges, or of the Agrumi in Italy, and their culture."

But the more limited acceptation, which betokens *acid fruits* only, and most particularly *Lemons* and *Oranges*, or rather all the species and varieties of the genus *Citrus*, is the most common. Sometimes, Pomegranates and other fruits, as Dr. Sickler observes, (but which fruits, I beg leave to add, must all be characterized by *acidity*,) are likewise included in that expression. Some authors have made use of a similar term* in Latin, viz. *acrumen*, derived from *acer ;* which term is not classical, but of modern fabrication, evidently manufactured in imitation of the Italian word, unless we were to suppose, that it had preceded the latter.

The *Agrumi* are now to be regarded as substitutes, in Italy, for almost every other kind of fruit. Figs and grapes are held in estimation ; but as for apples; pears, cherries, and other products of the orchard, they may be said to have become strangers to that country. This is the more surprising, as the former inhabitants, the ancient Romans, greatly excelled in the cultivation of these fruits. They formed a luxury of their tables, and neither expence nor trouble was spared, in obtaining them. At the present era, they are so much neglected, and their culture is so unsuccessful, that Dr. Sickler seems to be of opinion, that the climate and soil of Italy have undergone a change, and are no longer fit for the growth of those productions. But such a notion can hardly be considered otherwise than as erroneous ; and the fact, I apprehend, is to be solely accounted for from the diminished degree of care, which is bestowed upon those objects. I do not doubt, that an English gardener would raise fine fruit in Italy, as he is, by his skill, enabled to do in his own country, where many circumstances are far less favourable.

Among the *Agrumi*, the *Citrons* and *Lemons* were first introduced into Italy. They were derived from the East; and *Assyria*

* For instance, GALLESIO, in his *Traité du Citrus.*

and *Media* are distinctly named, as their native countries. Thence the Romans called this fruit the *Assyrian* or *Median Apple (Malum* Assyrium,* seu *Medicum)*; and consequently, the tree *Malus Assyria,* seu *Medica.*

We cannot admit, that this tree was brought into Italy, and there cultivated, so early as the time of the elder Pliny. For this author, in speaking of it (N. H. xii. 7. ed. Bip.) observes, that it would not grow any where, but in Media and Persia;† and that the attempt of transferring it to other climes had proved vain. He mentions, that it was medicinally used against poisons; and of the fruit he says expressly, that it was not eaten, but served, as well as the leaves, for a perfume: the kernels, he adds, were, in particular, employed by the Parthians, to sweeten the breath. The *Citrus tree (arbor citri),* which likewise comes under our genus *Citrus,* and is perhaps that species, or variety, to which Dr. Sickler gives the name of *Cedrate,* is recorded by Pliny (N. H. xiii. 29. ed. Bip.) as a native of Mauritania and Cyrenaica, in Africa. He only knows it for the value of its wood, of which the most precious and expensive tables were made; and subsequently (c. 31.) he notices a variety of it, *alia arbor eodem nomine,* which bore a fruit *(pomum)*‡ of a strong smell, and bitter taste. But it is manifest from the tenour of Pliny's language, that he was but imperfectly, or distantly acquainted with those productions; and that, far from being cultivated, they were

* Dr. Sickler is right in supposing, that the appellation *Malum* was given to this fruit, in imitation of the Greek μῆλον *(Melon* or *Milon)*; for Pliny remarks (N. H. xii. 7. ed. Bip.) that the Romans borrowed similar terms from the Greeks. And Dr. Sickler's conjecture, that the modern words *Lemon, Limon, Limone,* may be an inversion of the Greek *Melon,* or *Milon,* is ingenious.

† *Sed nisi apud Medos et in Perside nasci noluit.*

‡ In the *Elenchus,* or Table of Contents, which forms part of Pliny's first book, it is called *Malum citreum,* ed. Bip. Vol. i. p. 44.

scarcely known, in Italy, by name. Their introduction must have been much later, and we shall perhaps come near the truth, if we refer it to the second century after Christ. The Orange, which seems to be a native of the East Indies, reached Italy eleven or twelve centuries after the former, probably not before the fourteenth; and the sweet sorts were the very last introduced.

To see these fruits now so plentiful, in that as well as in other parts of Europe, may well excite our wonder. Dr. Sickler describes the abundance of them in Italy, particularly in the south, as astonishing You meet not only with groves of lemon and orange trees, but almosts with forests. The districts towards, or near, the sea coast, in the south and south-west, for instance about *Sorento* and *Amalfi*, seem to be most propitious. There those trees are quite domesticated: they grow, and thrive, as if they had originally belonged to that country. They also do well at, and about *Rome*, though in an inferior degree; and somewhat farther to the north, about *Florence* and *Milan*, they require aid and protection from art. Dr. Sickler remarks, that, in general, where the *Olive* is found, the *Agrumi* do not fail, provided that such a degree of attention, as local circumstances render necessary, is not withheld from them. But in the south of Italy, they may be said to need hardly any care, not more, certainly, or even less, than the common fruit trees in our orchards. Of the two main divisions, Lemons and Oranges, the latter are by far the most hardy; the sweet varieties, however, are tender, compared to the others, and are best provided for in warm situations. They do not endure cold exposures, and severe weather. The Oranges, at Rome, are generally planted as standards, in the open ground; the Lemons are usually trained on walls. But besides this, there are large and magnificent conservatories, or houses, in which all the different sorts of these trees, especially the rare and exquisite

varieties, are collected. When Dr. Sickler was at Rome, the most distinguished of those houses was that of Prince ANTONIO BORGHESE, in which, he relates, there were upwards of 70 sorts of lemons and oranges accumulated; and among them some, that are not to be seen any where else. The culture of those trees, in that house, was particularly well understood and conducted; and no other, not even that of the Pope, could vie with it. Such a house it would be worth while for any one to see, who is interested in the treatment and cultivation of those plants.

As you proceed from Rome towards Naples, and thence farther south, the view of those plantations become more and more striking. It is for the traveller to describe their beauty, and the pleasure that is experienced on entering such a grove.

The quantity of fruit produced, and the consumption of it, throughout Italy, are surprising. Hardly any other fruit is eaten. There is only a suspension, in the use of the *Agrumi,* during the hottest part of the summer, when their ascidity is supposed to be injurious to the constitution, weakening, and productive of fevers.

Dr. Sickler divides *all the Agrumi* into *Two Classes,* under which there are divisions and subdivisions. This arrangement, as has before been intimated, is not botanical; the species and varieties are not distinguished, but are promiscuously to be looked for, in their several compartments. Thus, for example, *the Shaddock,* or *Citrus Decumana,* will be found in the second class (the oranges), third division (sweet oranges), eighth subdivision (being the eighth sort.)

THE TWO CLASSES.

A. LEMONS, *(Agrumi Limoni.)*

B. ORANGES, *(Agrumi Arancj.)*

DIVISIONS OF THE FIRST CLASS,
Comprehending all the sorts of Citrons and Lemons.

I. CEDRATES.
II. COMMON LEMONS.
III. CEDRATE LEMONS, or CITRONATES.
IV. LUMIES.
V. LIMES.

DIVISIONS OF THE SECOND CLASS,
Comprehending all the Oranges.

I. BITTER ORANGES.
II. SOUR ORANGES.
III. SWEET ORANGES.

Class A. THE LEMONS, (Ital. *Agrumi Limoni.*)
Division I. CEDRATES, (Ital. *Limoni Cedrati.*)

The *Cedrate* is a variety of the Lemon, or Citron, distinguished by its large fruit, of which the flesh is thick, spungy, or fungous, fine flavoured and eatable. It contains but little juice, compared to the other fruits of this class, and has very few and small seeds; the skin is oily. I doubt, whether this variety be known to English gardeners; they would, probably, include it in the denomination of *Citron*. In Martyn's edition of Miller's Dictionary, there is a passage, under the article *Citrus*, No. 9, which perhaps refers to it. The words are as follows: "In China and other parts of the East, they have a remarkable variety of Lemon, or Citron, which has a solid fruit, without any cells, or pulp, and divided above the middle into five or more long round parts, a little crooked, and having the appearance of the human hand, with the fingers a little bent, whence the Chinese call it *Phat thu*, or fingered Lemon. It is a monstrous fruit, a mere curiosity,

without any use." This information is derived from Loureiro, and seems, in some points, applicable to what Dr. Sickler calls the *Gigantick Cedrate.* The appellation *Cedrate,* (Ital. *Cedrato,*) comes from *Cedro,* which is the Italian for *Citron.* This tree is very delicate, and only prospers in a warm climate, being impatient of rough air, cold rain, or snow. It succeeds, however, admirably in the south of Italy, and best towards the sea; for instance, about *Reggio* and *Amalfi.* But even there, these trees, are commonly trained against walls, and carefully sheltered; they are seldom found as standards.

The Subdivisions of the *Cedrates* furnish four varieties, or sorts.

1. *Common Furrowed Cedrate,* (Ital. *Cedrato volgare solcato.*)

Fruit cylindrical, with a conical point: length 10—15 inches; breadth, or diameter, 6—9; weight 8—12—pounds. The size of these trees is not described by Dr. Sickler, because they are generally trained, as espaliers.

2. *Common Gourd-shaped Cedrate,* (Ital. *Cedrato volgare cocomerato.*

Length of the fruit 6—7 inches; diameter, at the neck about 3 inches, in the middle about 8; weight 10—14 pounds.

3. *Sweet Cedrate of Reggio,* (Ital. *Cedrato dolcissimo di Reggio.*)

This Cedrate is more juicy, than the others, and of a sweet, and pleasant flavour. Fruit cylindrical, with a smooth surface: the others are generally rough; length 6—7 inches; breadth, or diameter, 3—3½; weight 5—7 pounds.

4. *Gigantick Multiform Cedrate,* (Ital. *Cedrato gigante di forma incerta;* Lat. *Malum citreum maximum multiforme.*)

It varies much in form; the outer rind of the fruit is very porous. Length 10—17 inches; breadth, or diameter, 6—9; weight 15—16 pounds.

Division II. COMMON LEMONS, (Ital. *Limoni volgari*, or *semplici.*

This is a numerous division. The fruit is small, compared to the Cedrates ; juicy, with full seeds, and without flesh.

Twenty-eight sorts, or varieties, distributed in the following subdivisions.

1. *Round-shaped Lemons.*
2. *Pear-shaped.*
3. *Cylindrical.*
4. *Gourd-shaped.*
5. *Wax Lemons.*

Subdivision 1. *Round-shaped Lemons.*

Six sorts, viz.

a. *Incomparable Lemon,* (Ital. *Limone incomparabile.*)
Tree 6—8 feet high.

b. *Round Lemon, with a spine at the end of the fruit,* (Ital. *Limone tondo, colla spina alla punta.)*
Tree 6—8 feet high.

c. *Round Florence Lemon,* (Ital. *Limone tondo di Firenza.)*
Tree 6—8 feet high.

d. *Small round Calabrian Lemon.* (Ital. *Limone piccolo tondo di Calabria.)*
Tree 17—19 feet high.

e. *Round Ligurian Lemon of St. Remi,* (Ital. *Limone di San Remi in Liguria tondo.)*
Tree about 20 feet high, stem 1 foot in diameter.

f. *Round Genoese Lemon,* (Ital. *Limone di Genoa tondo.)*
Tree about 25 feet high.

Subdivison 2. *Pear-shaped Lemons.*

Eleven sorts, viz.

a. *Rough-coated, or warty Lemon,* (Ital. *Limone rugoso.)*
Tree 5—8 feet high.

b. *Lemon of Amalfi,* (Ital. *Limone d' Amalfi.)*
Tree 22—25 feet high.

c. *Imperial Lemon,* (Ital. *Limone Imperiale.)*
Tree 6—8 feet high.

d. *Lemon of St. Remi,* (Ital. *Limone di San Remi.*)
Tree about 30 feet high.

e. *Sweet juicy Roman Lemon,* (Ital. *Limone di Roma dolce.)*
Tree 6—8 feet high.

f. *Sbardonick Lemon, with a spine to the fruit,* (Ital. *Limone di Sbardoni, colla spina alla punta.)*
Tree 5—8 feet high.

g. *Common Striped, or Ribbed, Amalfi Lemon,* (Ital. *Limone comune listato d' Amalfi.)*
Tree small, and puny.

h. *Long-necked Lemon,* (Ital. *Limone al lungo collo.)*
Tree 6—8 feet high.

i. *Pear-like Lemon,* (Ital. *Limone in forma di pera.)*
Tree 8—12 feet high.

k. *Striped, or Ribbed, Lemon,* (Ital. *Limone listato* ; Fr. *Limon rayé.)*
Tree 6—7 feet high.

l. *Pear Lemon,* or *Peretta Lemon,* (Ital. *Limone Peretta.)*
Tree 5—7 feet high.

Subdivision 3. *Cylindrical Lemons.*

Four sorts, viz.

a. *Reggio Lemon,* (Ital. *Limone di Reggio.)*
Tree 16—25 feet high.

b. *Common Roman Cylindrical Lemon,* (Ital. *Limone di forma cilindrica comune Romano.)*
Tree about 25 feet high.

c. *Cylindrical Lemon of Rosoli,* (Ital. *Limone cilindrico di Rosoli.)*
Tree 5—8 feet high.

d. *Cylindrical Furrowed Amalfi Lemon,* (Ital. *Limone cilindrico d' Amalfi solcato.)*

Tree rarely seen as a standard.

Subdivision 4. *Gourd-shaped Lemons.*

Two sorts, viz.

a. *Gaeta Lemon,* (Ital. *Limone di Gaeta.)*

Tree about 30 feet high.

b. *Laura Lemon,* (Ital. *Limone di Laura.)*

Tree about 8 feet high.

Subdivision 5. *Wax Lemons,* (having the colour of bee's wax. Ital. *Limoni di cera ;* Fr. *Limons de cire.)*

Five sorts, viz.

a. *Red Wax Lemon,* (Ital. *Limone di cera rosso)*

Tree 4—6 feet high.

b. *Roman Wax Lemon,* (Ital. *Limone di cera Romano.)*

Tree 5—6 feet high.

c. *Ligurian Wax Lemon,* (Ital. *Limone di cera di Liguria.)*

Tree 4—5 feet high.

d. *Chalcedonian Wax Lemon,* (Ital. *Limone di cera Calcedonico.)*

Tree very short and puny.

e. *Great Ligurian rough-coated Wax Lemon,* (Ital. *Limone di Liguria grandissimo.).*

Fruit 7—10 inches in length ; 6—8 in breadth, or diameter.

Tree 5—6 feet high.

DIVISION III. CEDRATE LEMONS, or CITRONATES, (Ital. *Limoni Cedrati, Limoni Citronati.)*

This is a fruit between the Cedrate and the Common Lemon, and probably what the French mean by *Poncire.* The tree is tender, and requires protection from the weather.

Six varieties, or subdivisions.

1. The *long, pointed, Cedrate Lemon,* or *Citronate,* (Ital. *Limone Cedrato lunghissimo.*)

   Fruit 5—7 inches long, about three in diameter. Tree usually trained. The fruit of the other varieties is less.

2. *Cedrate Lemon of Amalfi,* (Ital. *Limone Cedrato d'Amalfi.*)

   Tree 6—7 feet high.

3. *Cedrate Lemon of Siena,* (Ital. *Limone Cedrato di Siena.*)

   Tree 7—8 feet high.

4. *Cedrate Lemon of Rome,* (Ital. *Limone Cedrato di Roma.*)

   Tree 4—6 feet high.

5. *Cedrate Lemon of Florence,* (Ital. *Limone Cedrato di Firenza.*)

   Tree 7—8 feet high.

6. *Wild Cedrate Lemon,* (Ital. *Limone Cedrato bruto.*)

   The juice of this fruit is very acid, and harsh. Tree 6—7 feet high.

Division IV. THE LUMIES, or LOMIES, (Ital. *Lumie, Lomie;* Fr. *Lumies.*)

The Lumies seem to be a variety between the Cedrates and the Cedrate Lemons; and may be considered as the finest improved sort of the whole class of Lemons.

Two subdivisions, namely;

1. *Lumies, strictly so called.*
2. *Apple Lumies.*

Eight sorts, in both together.

Subdivision 1. *Lumies properly so called.*

Five sorts.

a. *Lumy of Jerusalem,* (Ital. *Lumia di Gierusalemme.*)

   Fruit 5—6 inches long, about 4 in diameter. Tree commonly trained.

b. *Pot Lumy of Reggio,* (Ital. *La Giaretta di Reggio.*)

So called from its shape. Fruit $4\frac{1}{2}$—$5\frac{3}{4}$ inches long, $3\frac{3}{4}$—$4\frac{1}{2}$ in diameter. Tree 5—8 feet high.

c. *Genoa Lumy,* (Ital. *Lumia di Genoa.*)

It is also called *Valentine Lumy.* Fruit about the size of the preceding ones. Tree 4—6 feet high.

d. *Lumy of St. Dominick,* (Ital. *Lumia di S. Dominico.*)

Fruit nearly the size of the foregoing ones. Tree commonly trained.

e. *Round Pear-shaped Lumy,* (Ital. *Lumia tonda peretta.*)

Fruit smaller than that of the others; 2—$2\frac{1}{2}$ inches long, and nearly the same breadth. Tree 4—5 feet high.

Subdivision 2. *Apple Lumiès.*

a. *Paradise-Apple Lumy,* (also called *Paradise-Apple Lemon.* Ital. *Limone di Mela di Paradiso.*)

Fruit 5—6 inches in length $2\frac{3}{4}$—$3\frac{1}{4}$ in diameter. Tree very short in the stem, and commonly trained.

b. *Adam's-Apple Lumy of Reggio,* (also called *Adam's-Apple Lemon of Reggio;* Ital. *Limone detto Pomo d'Adamo di Reggio.*)

Fruit 4—$4\frac{1}{2}$ inches long, 3—$3\frac{1}{2}$ in diameter. Tree 4—5 feet high.

c. *Common Roman Adam's-Apple Lumy,* (also called *Common Roman Adam's-Apple Lemon;* Ital. *Limone detto Pomo d'Adamo Romano volgare.*)

Fruit 3—4 inches long, nearly as much in diameter. Tree trained.

Division V. THE LIMES, (Ital. *Le Lime;* Fr. *Les Limes.*)

The Limes are sprung from a mixture of the first and second classes, that is, of the Lemons and Oranges. The fruit has, generally, the character of the Lemon, resembling it in acidity; and the tree that of the Orange, having winged leaves. They

are thence defined by Gallesio, by the term of *Citrus Medica Limon Aurantiata.* The varieties thus raised may be supposed to exist in great number, if slight shades of difference are admitted as distinctions. Dr. Sickler subdivides them into the following four, as the most remarkable.

1. *Small round sweet Lime,* (Ital. *Lima piccola dolce tonda.*)
   Fruit 2—2½ inches long, 1½—1¾ in diameter. Tree 3—4 feet high.

2. *Round Roman Lime,* or *Bergamotte Lime,* (Ital. *Lima Romana tonda, il Bergamotto;* Fr. *Lime de Rome ronde, Lime Bergamotte.*)
   Fruit 2¾—3 inches long, 3 in diameter. Tree high-stemmed, the exact measure not given.

3. *Heart shaped Lime,* (Ital. *Lima a forma di cuore.*)
   Fruit both in length, and breadth, 4—6 inches. Tree trained.

4. *Long monstrous Lime,* (Ital. *Lima lunga monstrosa.*) It is also called the *Cedrate Lime.*
   Fruit 8—10 inches long, 5—7 in breadth. Tree trained.

Class B. THE ORANGES, (Ital. *Agrumi Arancj.*)

Division I. BITTER ORANGES, (Ital. *Arancj volgari.*)

Six sorts.

1. *Common Bitter Orange,* (Ital. *Arancio forte;* Fr. *Bigarade.*)
   Fruit round, somewhat flattended, dark gold-coloured. Tree 18—20 feet high. This is reckoned a good stock to graft the other sorts upon.

2. *Bitter Orange, with half double blossom,* (Ital *Arancio forte a fior semidoppio;* Fr. *Bigarade à fleur double.*)
   Fruit perfectly round, light yellow. Tree 12—14 feet high.

3. *Bitter Orange, with curled leaves,* (Ital. *Arancio a mazzetto;* Fr. *Orange à feuilles frisées.*)
   Fruit perfectly round, gold colour. Tree 5—6 feet high.

4. *Bitter Dwarf Orange of Goa,* (Ital. *Nanino da China*; Fr. *Petit Chinois, Muscade.*)

Fruit very small. Tree 3—4 feet high.

5. *Bitter Myrtle-leafed Dwarf Orange,* (Ital. *Nanino da China a foglia di mirto.*)

Fruit quite round, dark gold colour. Tree at most 3 feet high.

6. *Willow-leaved Bitter Orange,* (Ital. *Arancio a foglia di salice.*)

Fruit round, with a warty point; colour greenish yellow. Tree about 14 feet high.

Division II. Sour Oranges, (Ital. *Arancj Cedrati.*)
Six sorts.

1. *Common Sour Orange,* (Ital. *Arancio forte a medolla dolce;* Fr. *Orange participant de l'aigre et du doux.*)

Fruit round, light gold colour. Tree 12—16 feet high.

2. *Large Sour Orange, with a sweet and eatable rind,* (Ital. *Arancio forte a frutto grosso e scorza mangiable;* Fr. *Bigarade à écorce douce.*)

Fruit round, with a wart-like point; 5—6 inches, both in length and in breadth; reddish gold-colour. Tree 12—16 feet high, very stout.

3. *Sour Cedrate Orange,* (Ital. *Arancio Citronato;* Fr. *Lumie Orangée.*)

Fruit 5—6 inches in length, and in breadth; round, somewhat flattened at the stalk; bright gold colour. Tree 12—18 feet high.

4. *Sour Adam's-Apple Orange,* (Ital. *Pomo d'Adamo;* Fr. *Pomme d'Adam, Lumie d'Espagne.*)

Fruit 6—7 inches in length and breadth; quite round; reddish gold colour. Tree 12—14 feet high.

5. *Sour Violet Orange,* (Ital. *Arancio forte violetto;* Fr. *Bigarade violette.*)

The fruit, which is round, but flattened at the stalk and opposite end, and of a bright gold colour, has violet streaks, both within and without. It is about 2 inches in length, and the same in breadth. Tree 8—10 feet high.

6. *Sour Star Orange,* (Ital. *Arancio stellato, Arancio Melarosa ;* Fr. *Orange étoilée.*)

Fruit small ; 1½—2 inches, both in length and breadth ; round, with a wart-like point ; bright gold colour. The inside is marked as with a cross or star ; whence the name. Tree 4—5 feet high.

Division III. Sweet Oranges, (Ital. *Pomi di Sina, Portogalli.*)

The sweet Oranges are supposed to have been brought from the East Indies, about the end of the fifteenth century, by *Vasco de Gama,* to Portugal, and thence to have been spread over the south of France, and over Italy.

Twelve sorts.

1. *Common Sweet Orange,* (Ital. *Arancio dolce, Portogallo, Melangolo* ; Fr. *Orange douce.*)

Fruit 2—3 inches, both in length and breadth ; round, somewhat flat at the ends, but now and then tapering; bright yellow red. Tree near 25 feet high.

2. *Sweet Olysipo China Orange,* (Ital. *Arancio fino della China ;* Fr. *Orange de la Chine.*)

Fruit round ; 2—2½ inches in length and breadth ; greenish gold colour.

3. *Sweet Philippine Orange, with crimson juice,* commonly called the *Malta Orange,* (Ital. *Arancio di sugo rosso, Sanguigno ;* Fr. *Orange Grenade, Orange de Malte.*)

The blood-red Orange thrives in Malta, and also very much in Calabria ; likewise about Amalfi and Naples, but not so well at Rome, Florence, and in the north of Italy. The

fruit is round; the colour of the rind is reddish yellow. The common size is stated by Dr. Sickler at 2—2½ inches, in length and breadth, but in Calabria and Malta, he says, they grow larger, to 3—4 inches, in length and breadth. Tree 12—14 feet high.

4. *Sweet Dwarf Orange,* (Ital. *Arancio nano dolce;* Fr. *Oranger nain à fruit doux.)*

Fruit 1—1½ inches, in length and breadth; reddish gold colour. Tree 3—4 feet high.

5. *Sweet Olive-shaped Orange,* (Ital. *Arancio oliviforme a scorza dolce;* Fr. *Oranger à fruit oliviforme.)*

Fruit very small, like an olive in shape; greenish gold colour. Tree 3—4 feet high.

6. *Sweet Philippine Orange, with yellow juice,* (Ital. *Arancio a scorza dolce;* Fr. *Oranger à fruit doux, et à écorce douce.)*

Fruit round; 1—2 inches, in length and breadth; bright yellow. Tree 7—10 feet high.

7. *Sweet Orange, with half double blossom,* (Ital. *Arancio a fior doppio;* Fr. *Oranger à fleur double.)*

Fruit round, occasionally with a wart-like point; 2—3 inches, in length and breadth; deep yellow. Tree about 20 feet high, and very stout.

8. *Sweet Pompelmouse Orange,* the English *Shaddock,* (Ital. *Arancio massimo;* Fr. *Orange Pompelmouse.)*

This Plant, which is the *Citrus Decumana* of botanists, had its English appellation from Captain SHADDOCK, who first brought it from the East Indies. Dr. Sickler states the size of the fruit at 7—8 inches, both in length and breadth, and the weight at 14 pounds. It is said to be very sweet, in its native climate; but it has, in this respect, degenerated, in other quarters, whither it has been transplanted,

for instance, in the West Indies; which may be owing to a want of proper culture. The tree attains a height of 12—16 feet. It is, according to Dr. Sickler's account, very scarce in Italy, and only to be met with in some of the principal orange-houses, at Rome and Naples.

9. *Sweet White, or Striped, Orange,* (Ital. *Arancio bianco;* Fr. *Oranger à fruit blanc.)*

Fruit oblong, 2 inches in length, $1\frac{1}{2}$ in diameter; colour light yellow, with dark yellow stripes. Tree slender, 10—12 feet high.

10. *Sweet Variegated Orange*, (Ital. *Arancio listato;* Fr. *Orange panachée.)*

Fruit quite round; 2—3 inches, in length and breadth; colour light yellow, variegated with prominent greenish ribs, or stripes. Tree 10—12 feet high.

11. *Common Sweet Winter Orange,* (Ital. *Arancio dolce d' inverno;* Fr. *Orange douce d' hiver.)*

Fruit round; 2—3 inches, in length and breadth; colour deep yellow. Tree 12—16 feet high.

12. *Sweet Rose Orange,* (Ital. *Arancio di Rosa;* Fr. *Orange de Rose.)*

Fruit very fragrant; round, about 2 inches in length and breadth; colour deep yellow. Whence it is called *Rose Orange,* does not quite appear from Dr. Sickler's account; whether it be from the fragrance of the fruit, or from some particular shades of colour, in the inside and on the outside, to which that author alludes.

I have, in the foregoing pages, given a cursory, or brief, delineation of Dr. Sickler's Treatise, interspersed with remarks of my own. The space allotted for the present communication did

not permit a more copious and full report of that author's statements. Several details, such as the minuter descriptions of the trees, foliage, and fruits, the accounts of the culture and management of the plants, and the observations on other writers, who have spoken of them, I have left untouched; as it was only my purpose to give a general view of the subject.

II. *Substance of a Memoir by M.* Jean Thouin, *on the Use of the* Scoria of the Forge *in Horticulture; printed in the Annales du Museum, Vol.* xvi. *page* 35. *Translated by Mr.* John Turner, *Assistant Secretary.*

Read April 6, 1819.

The injury which plants, in pots, sustain from the ravages of worms and other insects, induced M. Jean Thouin to turn his attention to the discovery of some mode of preventing it. Finding the *Scoria of the Forge* a cheap material, on account of the very limited demand for it in France, he resolved to make trial of it, not only as a basis in the open air, on which pots were to stand, but also in the houses where no bottom heat from tan was required: this he adopted, after many fruitless experiments with other materials, and his success was equal to his hopes. The way in which plants in pots are most injured by worms and other insects, M. Thouin conceives, is by their insinuating themselves into the mould through the aperture at the bottom of the pots, attracted by the freshness of the earth, through which they open passages, and thereby not only admit the external air in too great a quantity to the roots of the plant, but suffer the water which may be given to it to flow off without benefiting the roots; and at the same time permitting the siliceous particles to escape, leave nothing but a compact and inert mass, in which the roots are compressed without nourishment.

In forming his platform in the open air, M. Thouin proceeds thus: in such situations as he intends to place his pots, he spreads the Scoria very evenly over the surface of the ground, four or five inches thick, having previously run it through a riddle, thereby

rejecting all pieces larger than a nut. The whole is beaten, to give it solidity, though not sufficiently to make it quite compact.

The plants being re-potted, after clearing their roots as much as possible from insects, they are placed out; and though the earth, over which the Scoria is spread, be full of worms, not one penetrates to the pots; not only because they find no nourishment in the super-stratum, but because the sharp, angular points of the Scoria present insurmountable obstacles to their passage through it.

The plants soon begin to shew the benefit derived from this change, acquiring vigour, and growing with the greatest luxuriance. The plants treated thus by M. THOUIN, are principally those of the Cape of Good Hope and New Holland, belonging to the Genera Protæa, Thymelea, Erica, and others. The same plan, however, is adopted, with equal success, with such tropical plants as are exposed to the external air in the height of the season; these were placed in a southern aspect, a little inclining to the east, on a similar basis of Scoria.

But as all these plants must necessarily be returned to the house on the approach of cold weather, and some of them even be placed on the tan bed, the insects with which the tan always abounds, soon find their way into the pots, and their old ravages upon the plants are renewed.

After having made several trials, M. THOUIN satisfied himself that bottom heat was not necessary to plants after their second or third year, but that the atmosphere of the house, if sufficiently warm for the plant, was equally so for its roots: he therefore rejected the tan bed altogether, and supplied its place in the pit with earth, upon which he laid a bed of Scoria, in the same way as those in the open air, and upon the surface of this he placed his pots. The change in the plants thus treated was soon perceived, and was not less striking than it had been on those in the open air. Consequently the expense of tan, and the labour

necessary in managing it were saved, and the dirt it occasions in its removal avoided.

It is scarcely necessary to observe, that the Scoria cannot supersede the use of those tan beds where bottom heat is required for the germination of seeds, for accelerating the growth of bulbs, striking cuttings, or encouraging the growth of young tropical plants: without bottom heat these objects of the horticulturist's care would perish.

III. *On the Country where the* Apricot Tree *grows wild. By* M. L. Regnier. *Translated from the French in the Magazin Encyclopédique for November,* 1815. *By* Richard Anthony Salisbury, *Esq. F. R. S. &c.*

Read June 15, 1819.

The name of *Prunus Armeniaca,* given to the *Apricot* tree ever since the time of Columella and Pliny, seems to have established an opinion of its being indigenous to *Armenia* so firmly, as to have been repeated by one writer after another up to the present day, without ever examining on what foundations that opinion rested. Yet the very early season in which this tree flowers here (in France), while liable to perpetual returns of frost, having raised doubts in my mind on this point, I became anxious to examine whatever might have been said about its origin. All vegetables, from what I could ever learn respecting their organization, are so formed as to perpetuate themselves by seeds in the climates where they originate. If obstacles were thrown in the way of this by nature, the species would soon cease to exist. It therefore appears to me, that *Armenia,* a high mountainous country, the climate of which resembles that of middle *Europe,* cannot possibly be the country of a tree, which begins to flower so early, that its blossoms are often destroyed by frost, notwithstanding all the care we bestow upon them. Left to itself, the *Apricot* tree with us would no doubt soon disappear ; and it is a remarkable fact, that though it has now been extensively cultivated in most parts of *Europe* for many ages, it has never yet sprang up from seeds in any of our forests. Neither has it been found wild, either in *Armenia* or in any of the neighbouring pro-

vinces. The opinion, therefore, of its having originated in that country rests solely on its name.

Before I venture to say any thing more relative to the subject, it will be necessary to bring into one point whatever lights ancient writers afford us.

THEOPHRASTUS, the oldest author after ARISTOTLE, whose writings have been preserved, never mentions the *Apricot* tree as being cultivated in *Greece*, at the period when he lived: on the contrary, he alludes to it as an exotic, with only a very short account transmitted to him, and he does not even give it any name. This silence, however, of THEOPHRASTUS respecting it, would hardly alone have determined me to conclude, that the *Apricot* tree was then unknown to the *Greeks*, if this excellent naturalist had not related to us, that of all the trees in his country, the *Almond* was the only one in which the flowers appeared before the leaves.* If the *Apricot* tree, which has the same character, had been known to THEOPHRASTUS, he would surely have mentioned it; for the accuracy of all his statements is well known to those who study his writings, unfortunately too much neglected.

COLUMELLA is the oldest *Roman* witer who mentions the *Apricot* tree;† but he enters into no detail, confining himself to the observation, that its fruit must be gathered at the same time as the *Damascus Plum*, and calling it the *Armenian Plum.* In another place, he says, that at the end of *January* we may graft *Cherry* trees, the *Armenian Plum*,‡ the *Nectarine*, the *Almond*, the *Peach* tree, and others which push early. Hence it appears, that in the *Augustan* age, the *Apricot* tree was known to the *Romans* by the name of *Armenian Plum* tree.

* Theophrasti Hist. Plant. lib. vii. c. 12.

† Columella, lib. x. v. 404.

‡ Columella, lib. xi. c. 2. In the edition by Gesner, Lipsiæ, 1735, the *Armenian Plum* is omitted.

Pliny, the successor of Columella, gives it the same name, classing it among the species of *Plum;* and he says, that its blossoms immediately succeed those of the *Almond.* Many persons think that both Pliny and other writers have spoken of the *Apricot* tree under the title of *Præcox;* but this tree was most probably some variety of early *Plum*, being employed chiefly as a stock for grafting others upon, more especially the *Peach* tree.

Palladius has regarded these two trees as distinct, saying, " sed Pruno *Armenia* inseremus et *Præcoqua*." It may appear to some from another passage of this author's " *Armenia* vel *Præcoqua* in prunis inseruntur," that he regarded them as one and the same tree, but I differ from them, and consider the word *vel* as synonymous with *et.*

In the compilation of *Geoponic* writers, I find a paragraph of great importance relative to the subject; it is an extract from the writings of a writer called Democritus, of whom no positive information remains; but he could not be the celebrated philosopher of that name, though he also wrote several books on agriculture, which are lost: for, if the extract was written by him, the *Apricot* tree must have been long known in *Greece* when Theophrastus wrote, a fact which I have already shewn to be improbable. Neither does any thing in the paragraph favour such an opinion; but without being able to fix positively when this Democritus did live, it was evidently later. In this paragraph he complains of the innovations which were affected to be made in his time in the names of fruits, and he quotes the *Apricot* as one of them: this fruit, says he, hitherto known by the name of *Berikokka,* they wish to call *Armeniaca.* He gives no reason why this innovation was attempted, so that his information is in some degree incomplete; but it is quite certain, that the *Apricot* tree had been already introduced into countries where the *Greek* language was spoken, by the name of *Berikokka,* before that of *Armeniaca* was substituted. It appears likewise that its old name

of *Berikokka* was preserved in *Greece,* for it occurs in the writings of Galen.

As *Armenia,* therefore, from its very climate, cannot have been the native country of the *Apricot* tree, and not one of the ancient writers has ever positively asserted that it came from thence, we must travel for it into some other region.

The early season in which its blossoms appear, first made me suspect that it might have been introduced into *Europe* from *Africa* ; and before I ascertained this to be a fact, I was struck with its mode of growth in *Egypt,* where it was formerly brought from a still more southern latitude. There, scarcely have its leaves fallen off, before an ascending sap opens the blossoms, without any chance of their suffering from cold. The name of *Berikokka,* first given to it, even in *Greece,* approaches very near to its *Arabian* name of *Berkach,* in the plural number *Berikhach,* merely varying in aspiration. In reading and meditating on the writings of Theophrastus with the attention they merit, I noticed that he spoke of a fruit from a country dependant on *Thebes,* which belongs to the genus * *Kokhumelea,* the stone of which is round, and which is gathered and dried by the inhabitants : he remarks, nevertheless, that it is evergreen, and flowers in the month of *November,* two characters which do not correspond with the *Apricot* tree ; but Theophrastus never saw the tree himself, and his correspondent, from the short period of its being without leaves in *Africa,* might have misled him. As for the time of its blossoming, I have seen the *Apricot* tree in flower at the end of *December* in *Upper Egypt,* and this, no doubt, takes place sooner in latitudes still more southern. In a country where so little change of climate has occurred, modern customs serve to explain old ones. Accordingly the inhabitants of those fertile

* This name of *Kokhumelea* is still given in *Calabria* to a species sf *Prunus* growing wild, the bark of which is an active febrifuge, and employed there as such : it will be published in the Flora *Neapolitana* by that name.

insulated spots in the deserts, called *Oasis,* there gather and dry large quantities of *Apricots,* which they bring down to *Egypt* for sale; these *Apricots,* called *Michmich,* are small, with a very large stone in comparison to the dried pulp, a common character of many fruits, not altered by cultivation, but though small, have an excellent flavour. If I could have executed the plan I had formed of travelling into the *Oasis,* more certain knowledge about these trees would have been obtained; but a whim of General MENOU prevented me. Being disappointed in this, the result of every enquiry I made of those who had been there, both *Arabs* and *Berberis* was, that the *Apricot* tree there grows spontaneously, almost without any cultivation, and that the only method of propagating it is by seeds; I have no doubt that it is the same fruit which was dried in the days of THEOPHRASTUS. He only knew it, however, from the account of his correspondent, it being then confined to more southern regions. We find, from the accounts of travellers, that besides the *Oasis* of *Egypt,* it grows also in the *Oasis* of *Bornou* and that of *Fezzan,* countries situated more to the west. Thus its limits appear to be a parallel between the *Niger* and the range of the *Atlas* mountains, from whence it has, by cultivation, been carried towards the north.

THEOPHRASTUS having written under the reign of the *Ptolemies,* the introduction of this tree into *Europe* could only have been effected in that of their successors; and the *Greek* dynasty in *Egypt* having increased the intercourse between the two countries, it is that epoch which I venture to fix upon for its coming to us. It is also very probable that the DEMOCRITUS above mentioned lived at the same period, and that he was consequently prior to COLUMELLA, who adopted the name of *Armenian Plum.*

LIST *of* DRAWINGS *of* FRUITS *executed by* ORDER *of the* COUNCIL, *between May* 1, 1817, *and May* 1, 1818.

1. The Cockle Pippin.
2. The Crofton Apple.
3. The King of the Pippins.
4. The Nonpareil.
5. The Red Quarenden Apple.
6. The Bigarreau Cherry.
7. The Elton Cherry.
8. The Large Blue Fig.
9. The White Fig.
10. The Damson Grape.
11. The Esperoine Grape.
12. The Grisley Frontignac Grape.
13. The Black Hamburgh Grape.
14. The Red Hamburgh Grape.
15. The Blue Muscadine Grape.
16. The Elruge Nectarine.
17. The Violette Hâtive Nectarine.
18. The Colmar Pear.
19. The D'Auch Pear.
20. The True St. Germain Pear.
21. The Enville Pine.
22. The Queen Pine.
23. The Nectarine Plum.
24. The Bath Scarlet Strawberry.
25. The Roseberry Strawberry.

LIST *of* DRAWINGS *of* FRUITS *executed by* ORDER *of the* COUNCIL, *between May* 1, 1818, *and May* 1, 1819.

1. The Alexander Apple.
2. The Carlisle Codlin.
3. The Cornish July Flower Apple.
4. The Kerry Pippin.
5. The Nonesuch Apple.
6. Padley's Pippin.
7. The Siberian Harvey.
8. The Orange Apricot.
9. Knight's Early Black Cherry.
10. The Morello Cherry.
11. Tradescant's Cherry.
12. The Red Warrington Gooseberry.
13. The Black Frontignac Grape.
14. The White Muscat of Alexandria Grape.
15. The Pitmaston White Cluster Grape.
16. The Romana Melon.
17. Fairchild's Early Nectarine.
18. The White Nectarine.
19. The Aston Town Pear.
20. The Chaumontel Pear.
21. The Jargonelle Pear.
22. The Providence Pine.
23. Coe's Golden Drop Plum.
24. The Shropshire Damson.
25. The Red Antwerp Raspberry.

List of the Medals *presented by* Order *of the* Council *of the* Horticultural Society *of* London, *from May* 1, 1817, *to May* 1, 1818.

To Mr. William Morgan, Gardener to Henry Browne, Esq., of North Mimms Place, Hertfordshire, for his various communications on Winter Greens, read before the Society, the substance of which is published in the Transactions of the Society; the subject having been one of those for which Medals and Rewards were offered at the last Anniversary. May 6, 1817.

To John Williams, Esq., of Pitmaston, near Worcester, for his Paper on the live Fences best suited to gardens, and his other communications, published in the Transactions of the Society, May 6, 1817.

To Mr. Isaac Oldaker, Gardener to his Majesty, the Emperor of all the Russias, for his communication on forcing Mushrooms, published in the Transactions of the Society. May 6, 1817.

To Sir George Stuart Mackenzie, Bart., for his Paper on, and plan for, an improved Forcing-house, published in the Transactions of the Society. May 6, 1817.

To Mr. James Grange, Fruiterer, of Piccadilly, and Covent Garden, for the information he has communicated on the management and cultivation of the Roseberry Strawberry, and for his obliging attentions to the Society. September 2, 1817.

To Mr. William Hedges, Gardener to the Earl of Mansfield, at Kenwood, for the skill displayed by him in the cultivation of the Lobelia Fulgens; the particulars of which are published in the Transactions of the Society. October 7, 1817.

To Mons. Louis Claude Noisette, of Paris, for his obliging attention and liberality, in sending to the Society, from his garden at Paris, specimens of the different varieties of Fruits, grown in France. November 4, 1817.

To Mr. George Loddiges, of Hackney, for his invention of a plan for watering Plants in Houses, of which an account is published in the Transactions of the Society. January 6, 1818.

To Sir Oswald Mosley, Bart., for his account of the Aphis Lanigera, and of his experiments on the destruction of that insect; published in the Transactions of the Society. January 20, 1818.

To Mr. Charles Harrison, Gardener to James Stuart Wortley, Esq., of Wortley Hall, in Yorkshire, for the skill displayed by him in the care and management of his Peach trees, described by Dr. Noehden in his Papers published in the Transactions of the Society. January 20, 1818.

To William Kent, Esq., for his excellence in the cultivation of Aquatic Plants, an account of which is published in the Transactions of the Society. February 3, 1818.

To Richard Arkwright, Esq., for his Account of a method of retarding the ripening of Grapes, published in the Transactions of the Society. March 5, 1818.

To Mr. Thomas Baldwin, Gardener to the Marquis of Hertford, for his Treatise on the cultivation of Pine Apples, which he

has published, and of the merit of which the Society was convinced by the specimens of fruit received from him last year. March 5, 1818.

To Mr. James Dickson, of Covent Garden, Vice President of the Society, for the services rendered to the Society, by his unremitted diligence and zeal in promoting its interests. March 5, 1818.

To the Right Honourable William Wickham, for his Paper on the cultivation of Fig Trees, published in the Transactions of the Society. April 7, 1818.

List of Medals *presented by* Order *of the* Council *of the* Horticultural Society *of* London, *from May* 1, 1818, *to May* 1, 1819.

To Mr. George Mills, Gardener to Mrs. Grafton Dare, of Cranbrooke House near Ilford, Essex, for his cultivation of Cucumbers in hot-beds; particulars relative to which have been subsequently published in the Transactions of the Society. June 2, 1818.

To Mr. Hugh Ronalds, of Brentford, Fellow of the Society, for his communication on the Varieties of Brocoli and on the Method of Cultivating them, published in the Transactions of the Society; the subject having been one of those for which Medals and Rewards were offered at the last Anniversary. June 16, 1818.

To John Reeves, Esq. of Canton in China, Corresponding Member of the Society, for the service which he has rendered to Horticulture by forwarding the views of the Society in China. July 7, 1818.

To Mr. William Griffin, Gardener to Samuel Smith, Esq. of Woodhall, Hertfordshire, for the skill displayed by him in the Cultivation of Pines and Grapes; Specimens of which were exhibited at different Meetings of the Society. August 4, 1818.

To Mr. John Nairn, Gardener to John Cresswell, Esq. of Battersea Priory, for his communication on a newly constructed Garden Frame with rising lights, which has been published in the Transactions of the Society. August 18, 1818.

To Edward Barnard, Esq. Fellow of the Society, for the skill displayed by him in the raising and cultivating Piccatee Carnations; Specimens of which were exhibited at Meetings of the Society. August 18, 1818.

To Miss Charlotte Knight, for having raised the Early Black Cherry, an Account of which, by the President, has been published in the Transactions of the Society. August 18, 1818.

To George Henry Noehden, LL. D. for the various services which he has rendered to the Society, and for his different communications printed in its Transactions. September 15, 1818.

To Mr. Hugh Ronalds, of Brentford, Fellow of the Society, for the very splendid exhibitions of Apples, the produce of his own gardens, made to the Society at different Meetings. October 20, 1818.

To Robert Holden, Esq. for the very large Collection of Derbyshire and Nottinghamshire Apples, exhibited by him to the Society, which had been formed with considerable care and attention. November 3, 1818.

To Charles Nicholas Pallmer, Esq. Fellow of the Society, for the service rendered to Horticulture by the successful method adopted by him, of importing seeds of Tropical Plants from the West Indies, and for his liberality in presenting them to the Society and its Members. January 5, 1819.

To John Braddick, Esq. Fellow of the Society, for his zeal in the production of New Fruits, as proved by the exhibitions of Grapes, Peaches, and Apples, which have been made by him at various Meetings of the Society during the last year. January 5, 1819.

To Sir GEORGE STEWART MACKENZIE, Bart. Fellow of the Society, for his great attention to the objects of the Society in sending to its Meetings, during the last season, various collections of Apples from Scotland, formed with considerable care and trouble. January 5, 1819.

To Mr. MOSES BROWN of Glasgow, for two very large collections of Apples from Clydesdale, exhibited at Meetings of the Society during the last season. January 5, 1819.

To JOHN WILLIAMS, Esq. of Pitmaston, near Worcester, Corresponding Member of the Society, for his skill and success in raising new varieties of hardy Grapes and Apples, specimens of which have been exhibited; and more especially for the production of the Pitmaston White Cluster Grape, and the Pitmaston Russet Nonpareil; Figures, and Accounts of which are published in the Transactions of the Society, January 9, 1819.

To Mrs. MARY ANNE MALCOLM of Lamb Abbey in Kent, for her success in raising seedling Apple trees, fruits of which have been tasted at different Meetings of the Society, and highly approved, particularly that now named the Lamb Abbey Pearmain; a Figure and account of which is published in the Transactions of the Society. January 9, 1819.

To Mr. CONRAD LODDIGES of Hackney, for the spirit and liberality displayed by himself and sons, in the formation and completion of the extensive machinery by which the whole of their Hot-houses are warmed by Steam alone. January 9, 1819.

To DAVID HOSACK, of New York, M. D. Foreign Member of the Society, for having, by his present to the Society of Plants of the Seckle Pear, introduced into this country a new and

valuable Fruit; an account of which is published in the Transactions of the Society. January 9, 1819.

To AYLMER BOURKE LAMBERT, Esq. for the zeal and intelligence manifested by him in the introduction and cultivation of rare and curious plants from foreign countries. February 16, 1819.

To Mr. STEPHEN KERSHAW, Gardener to DANIEL HENRY RUCKER, Esq. of Melrose Hall, Wandsworth, for his skill in forcing Winter Cucumbers, and Strawberries; Specimens of which have been exhibited at Meetings of the Society. March 2, 1819.

LIST OF BOOKS, AND OTHER ARTICLES,

PRESENTED TO THE

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FROM MAY 1, 1818, TO MAY 1, 1819,

WITH THE NAMES OF THE DONORS.

AMERICAN PHILOSOPHICAL SOCIETY.

Transactions of the American Philosophical Society, held at Philadelphia, Vol. I. new Series. *Philadelphia,* 1818, 4to.

JACOB BIGELOW, M. D.

Bigelow's American Medical Botany, Vol. I.
Boston, 1817-18, 8vo.

JAMES BROGDEN, Esq. F. H. S.

Hervy, Catalogue methodique et classique de tous les Arbres, Arbustes fruitiers, et de Vignes, formant la Collection de l'Ecole Imperiale, établie près le Luxembourg. *Paris,* 1809, 4to.

M. AUGUSTE PYRAME DE CANDOLLE, F. M. H. S.

De Candolle Recueil des Mémoires sur la Botanique,
Paris, 1813, 4to.

M. CHARLES ROMAIN FEBURIER, C. M. H. S.

Feburier, Rapport fait à la Société d'Agriculture du Département de Seine et Oise. *Juin,* 1818, 8vo.

Feburier, Notice sur les Labours, lue à la Société d'Agriculture de Seine et Oise, *Juillet*, 1818. 8vo.

HENRY GRIMSTON, Esq. F. H. S.

Evelyn's French Gardener. *London*, 1672, 12mo.

ROBERT HOLDEN, Esq. F. H. S.

Model of a Skreen for Fruit Trees on Walls.

DAVID HOSACK, M. D. F. R. S. and F. M. H. S.

Coxe's View of the Cultivation of Fruit Trees. *Philadelphia*, 1817, 8vo.

Messrs. LODDIGES AND SONS.

The Botanical Cabinet, Parts XI. to XXIV. inclusive, *London*, 1818-19, 8vo.

JOHN CLAUDIUS LOUDON, Esq. F. H. S.

Loudon's Sketches of Curvilinear Hot-houses, 4to.

Mr. WILLIAM MALCOLM, F. H. S.

Taylor's Treatise on the Ananas. *Devizes*, 1769, 8vo.

Furber's Engravings of Fruits for every month in the year, 12 plates, folio. *London*, 1732.

GEORGE HENRY NOEHDEN, LL. D. F. L. S. &c.

Beckmanii Lexicon Botanicum. *Gottingæ*, 1801, 8vo.

Sickler, on the Genus Citrus (in German). *Weimar*, 1815, 4to.

M. LOUIS CLAUDE NOISETTE, C. M. H. S.

Le Jardin Fruitier, No. 1, 2, 3. *Paris*, 1818, 4to.

Le Bon Jardinier pour 1818. *Paris*, 1818, 12mo.

SIGNOR ANTONIO PICCIOLI.

Catalogus Plantarum Horti Botanici Musei Imperialis et Regalis Florentini. *Florentiæ*, 1818, 4to.

M. AUBERT DU PETIT THOUARS, F. M. H. S.

A Collection of the Works of M. Aubert Du Petit Thouars, consisting of,

Essais sur la Végétation. *Paris,* 1809, 8vo.

Notice sur la Moelle et du Liber, 8vo.

Recueil de Rapports et de Mémoires sur la Culture des Arbres Fruitiers. *Paris,* 1815, 8vo.

Histoire d'un Morceau de Bois. *Paris,* 1815, 8vo.

De la Germinaison des Plantes, 1816, 4to.

Plan du Verger Français. *Paris,* 8vo.

Le Verger Français. *Paris,* 1817, 8vo.

M. JOHN LOUIS RANSLEBEN, C. M. H. S.

Diel's Plan for laying out a Fruit Garden with Trees in Pots (in German). 2 Vols. *Frankfort,* 1804, 12mo.

Ransleben's Tracts for the Lovers of Horticulture (in German). *Berlin,* 1811, 12mo.

EDWARD RIGBY, M. D. F. L. S. &c.

Rigby's Holkham and its Agriculture, &c. third edition. *Norwich,* 1818, 8vo.

THE MANAGERS OF THE ROYAL INSTITUTION.

Journal of Science and the Arts, Parts X, XI, XII, XIII. *London,* 1818-19, 8vo.

JOSEPH SABINE, Esq. F. R. S. &c. Secretary.

Le Jardin Fruitier, 2 vols. *Paris,* 1810, 12mo.

L'Ecole du Jardin Potager, 2 vols. *Paris,* 1810, 12mo.

Evelyn's Acetaria, a Discours on Sallets. *London,* 1699, 12mo.

Curtis's Catalogue of Plants. *London,* 1783, 12mo.

Gordon's Catalogue of Plants. *London,* 1784, 8vo.

Cushing's Exotic Gardener. *London,* 1812, 8vo.

Dickson's and Co's. Catalogue of Plants. *London,* 1794, 8vo.

Bucknall's Orchardist. *London,* 1805, 8vo.

Forsyth on the Diseases of Fruit and Forest Trees. *London,* 1791, 8vo.

Græfer's Catalogue of Plants, third edition. *London,* 1794, 8vo.

Lobel, Stirpium Adversaria. *Londini,* 1570, folio.

Weston's English Flora. *London,* 1775, 8vo.

Phillips's Catalogue of Fruit Trees in 1812. *London,* 8vo.

Lindley's Plan of an Orchard. *Norwich,* 1796, large sheet.

Le Bon Jardinier, pour 1815. *Paris,* 1815, 12mo.

RICHARD ANTHONY SALISBURY, Esq. F. R. S. &c.

Justice's British Gardener's Director. *Edin.* 1764, 8vo.

HIS ROYAL HIGHNESS THE GRAND DUKE OF SAXE WEIMAR, F. H. S.

The Pomological Cabinet, consisting of upwards of 300 Specimens of Fruits, in Wax.

Drawing of a Tree belonging to the Genus Casuarina.

SIR JOHN SINCLAIR, BART. F. R. S. &c.

Duncan's Discourse, read at a Meeting of the Caledonian Horticultural Society, 10th March, 1818. *Edinburgh,* 1818, 8vo.

SIR JAMES EDWARD SMITH, F. R. S. P. L. S. &c.

Honorary Member of the Horticultural Society.

Smith's Considerations respecting Cambridge, more particularly relating to its Botanical Professorship. *London,* 1818, 8vo.

M. JEAN THOUIN, C. M. H. S.

Mémoire sur l'Emploi de Machefer dans le Jardinage, 4to.

Messrs. TREUTTEL AND WURTZ.

Rapport fait à la Société Royale et Centrale d'Agriculture, par M. le Comte François de Neufchateau, sur l'Agriculture et la Civilisation du Ban de la Roche. *Paris,* 1818, (2 copies).

Mr. JOHN TURNER, Assistant Secretary.

Robson's British Flora. *York*, 1777, 8vo.

M. PIERRE PHILIPPE ANDRÉ VILMORIN ANDRIEUX, C. M. H. S.

Le Bon Jardinier for 1818. *Paris*, 1818, 12mo.

SIR SAMUEL YOUNG, Bart. F. R. S. and F. H. S.

Commelinus Hortus Amstelodamensis, 2 Vols. *Amst.* 1697, folio.

Columella's Husbandry, translated into English. *Lond.* 1745, 4to.

Du Hamel's Husbandry, translated into English, second edition. *London*, 1762, 4to.

Lawrence's Gardening, fifth edition. *London*, 1717. 8vo.

LIST OF BOOKS, AND OTHER ARTICLES,

PRESENTED TO THE

LIBRARY OF THE SOCIETY,

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THE SOCIETY OF ARTS.

Transactions of the Society of Arts, Vol. 30 and 33.
London, 1813-15, 8vo.

List of Premiums offered by the Society of Arts in the year 1817.

THE POMOLOGICAL SOCIETY OF ALTENBURG.

Table of a System of Pears.

Mr. THOMAS BALDWIN, C. M. H. S.

Baldwin on the Culture of the Pine Apple Plant.
London, 1818, 12mo.

JOHN BRADDICK, Esq. F. H. S.

A Model of a Forcing House, on a new Construction.

WILLIAM BULLOCK, Esq. F. L. S. &c.

A Model of the Baltimore Apple, in Wax.

THE CALEDONIAN HORTICULTURAL SOCIETY.

Memoirs of the Caledonian Horticultural Society, Vols. 1 and 2. *Edinburgh*, 1814-15, 8vo.

AUGUSTUS FREDERICK ADRIAN DIEL, M.D. C.M.H.S.

Diel's Pomology, (in German), Vols. 19 and 20. *Franckfort*, 1816, 12mo.

ANDREW DUNCAN, Senior, M. D.

Discourses delivered to the Caledonian Horticultural Society, Dec. 4th, 1815, and Dec. 3d, 1816. *Edinburgh*, 8vo.

M. CHARLES ROMAIN FEBURIER, C. M. H. S.

Feburier, Essai sur les Phénomènes de la Végétation. *Paris*, 1812, 8vo.

Feburier, Mémoires sur quelques Propriétés du Fluid électrique. *Versailles*, 8vo.

THE ROYAL SOCIETY OF AGRICULTURE AND BOTANY OF GHENT.

Dix-septième Exposition Publique de la Société Royale d'Agriculture et de Botanique de la Ville de Gand, 8vo.

Dix-huitième Exposition Publique de la Société Royale d'Agriculture et de Botanique de la Ville de Gand, 8vo.

Réglement de la Société Royale d'Agriculture et de Botanique de Gand, 8vo.

Verbeek, Rapport fait à la Société Royale d'Agriculture et de Botanique de Gand, dans sa Séance de Juin, 1816, 8vo.

Cornelessen, Bouquet offert aux Bienfaiteurs de la Société Royale d'Agriculture et de Botanique de Gand, 1816, 8vo.

Hoorbeke, Mémoire sur les Orobanches. *Gand*, 1818, 8vo.

HENRY GRIMSTONE, Esq. F.H.S.

Ferrari Cultura di Fiore. *Roma,* 1638. Small folio.

Mr. JOSEPH HAYWARD.

Hayward's Science of Horticulture, including a Practical System for the Management of Fruit Trees. *London,* 1818, 8vo.

THE REV. GEORGE CHARLES HEMPEL, C.M.H.S.

Hempel's Magic Ring of Pomona, (in German.) *Ronneburg,* 1816, 12mo.

WILLIAM HOOKER, Esq. F.H.S.

Hooker's Pomona Londinensis, Vol. 1. *London,* 1818, 4to.

DAVID HOSACK, M.D. F.R.S. &c. F.M.H.S.

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